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INDEX TO VOLUME XVIII, 1948.

Articles :	PAGE
Abilities, The Future Measurements of (E. L. Thorndike)	21
Adult Students in Voluntary Courses, The Origins of Interest and Motives for Study of Natural Sciences and Psychology among (W. E. Flood and R. W. Crossland)	105
Educational Research, The Development of, in Great Britain (Parts II and III) (F. J. Schonell)	1, 53
General Information Test, A New (E. Anstey, R. F. Dowse and M. Duguid) . .	156
Insecurity and Social Maladjustment in Children (C. Sanders)	148
Interest in Practical Topics, Assessment of (E. A. Peel)	41
Newspaper Reading of Adolescents and Adults (W. D. Wall)	26, 87
Psychology, Some Present-Day Trends, Dangers, and Possibilities in the Field of— Presidential Address to the British Psychological Society (C. W. Valentine) . .	134
Selection of Pupils for Different Types of Secondary Schools, Symposium on the, III—A Method of Allocation used in a County Borough (V. J. Moore) ; IV—An Experimenter's Point of View (E. J. G. Bradford) ; V—The Selector's Point of View (J. J. Dempster)	16, 67, 121
Critical Notices :	
Gessell, Arnold and Ilg, Frances L. : The Child from Five to Ten (C. W. Valentine)	161
Summaries of Researches Reported in Degree Theses	48, 164
Authors :	
Anstey, E., Dowse, R. F., and Duguid, M. : A New General Information Test . .	156
Bradford, E. J. G. : Symposium on the Selection of Pupils for Different Types of Secondary Schools ; IV—An Experimenter's Point of View	67
Dempster, J. J. : Symposium on the Selection of Pupils for Different Types of Secondary Schools ; V—The Selector's Point of View	121
Flood, W. E., and Crossland, R. W. : The Origins of Interest and Motives for Study of Natural Sciences and Psychology among Adult Students in Voluntary Courses	105
Moore, V. J. : Symposium on the Selection of Pupils for Different Types of Secondary Schools ; III—A Method of Allocation used in a County Borough . . .	16
Peel, E. A. : Assessment of Interest in Practical Topics	41
Sanders, C. : Insecurity and Social Maladjustment in Children	148
Schonell, F. J. : The Development of Educational Research in Great Britain (Parts II and III)	1, 53
Thorndike, E. L. : The Future of Measurements of Abilities	21
Valentine, C. W. : Some Present-Day Trends, Dangers, and Possibilities in the Field of Psychology (Presidential Address to the British Psychological Society)	134
Wall, W. D. : The Newspaper Reading of Adolescents and Adults (Parts I and II) . .	26, 87

THE DEVELOPMENT OF EDUCATIONAL RESEARCH IN
GREAT BRITAIN.

PART II.—PRESENT FIELDS OF EDUCATIONAL RESEARCH.

BY FRED. J. SCHONELL

(Professor of Education in the University of Birmingham).¹

III.—*Individual differences in intelligence and scholastic attainments.* IV.—*Mental development in childhood and adolescence.* V.—*Measurement of general intelligence.*

IN this further study of the development of educational research in Great Britain the limitations of space have naturally imposed certain limitations of treatment. In the first place I have grouped the various fields of research under eight major headings²—a somewhat gross classification necessitated by a review of this kind. Secondly, I have indicated only very briefly some lines of advance in each field, often illustrating the nature of the research in a field by referring to a certain number of outstanding investigations only. Whenever possible, however, I have thought it useful to give examples of the way in which a new technique is used or to cite instances of the way in which educational findings have influenced (or might improve) educational practice. Further, it must be clear to many engaged in different branches of education, that although studies, which may be more narrowly termed educational research or educational psychology, have influenced educational practice, yet we owe a very great debt to investigations of a more purely psychological kind, particularly those relating to the unconscious mind.

III.—INDIVIDUAL DIFFERENCES IN INTELLIGENCE AND SCHOLASTIC
ATTAINMENTS.

The most effective way of assessing the nature of the advance in this field of knowledge is to contrast present educational provision with the prevailing practice in the first decade of the century.³ Then school classes of sixty, seventy and even eighty to ninety pupils were common; the class was the usual teaching unit and pupil grading was based entirely on either of two separate and exclusive criteria; the first was chronological age, in which case there was marked heterogeneity in talent and attainment in every class; the second was the

¹ In response to several suggestions we shall in future print the title or position of each author at the head of his article. This has become more desirable in view of the great increase in the circulation of the *Journal* abroad.

² Sections VI-XI will appear in the next number of this *Journal*.

³ Those requiring a fuller picture of changed conditions, and those sceptical of the advances that have been made, should read Ballard's excellent little book, *The Changing School* (Univ. Lond. Press), *The Silent Social Revolution*, J. A. Lowndes, and that informative volume *The First Fifty Years, 1897-1947*, Jubilee Volume of the National Association of Head Teachers (Univ. Lond. Press). Here Miss L. Le Swann (President N.A.H.T., 1937-38), writes: "I began with seventy-eight Standard II; many of my senior colleagues could remember eighty or more scholars in one class, and one mistress assured me that she knew of one who had ninety-nine and regretted it was not one hundred because then she would have 'made a song about it.'"

results of terminal tests and the annual examination, so that it was an accepted thing to have big boys of eleven, twelve or thirteen years in the first and second standards of all standard schools. The emphasis in instruction was almost entirely on intellectual aspects of education; there was little provision for creative and expressional activities; formal, lock step, repetitive methods were the general rule, and force and fear loomed large as determinants in discipline. In the main a child was deemed to have failed either because he was a dunce (i.e., dull) or because he was lazy, and little attention was paid to physical¹ emotional and environmental conditions as factors in school progress. Moreover, there was very little special State provision for either the brightest ten per cent. at one end, or the less able ten per cent. of dull and backward or defective at the other end, nor was there more than sporadic provision for the needs of children handicapped in other ways.

Now the changes from these conditions to the present educational pattern and practice reflect a greatly increased knowledge of children as individuals. Although the changes themselves have been actually achieved through a variety of forces—such as a keener social awareness, the continued professional efforts of the various teacher and educational organisations and the influence of educationists like Sir Percy Nunn, with his insistent emphasis on the needs and rights of the individual—yet the material that served the instruments of change came very often from the results of educational and psychological research. Increased information on individual differences and on forces shaping personality patterns has played an important part (as often indirectly as directly) in shaping administrative planning and in improving class-room practice. And although this knowledge has come in a piece-meal way from different sources it has gradually had a cumulative and interacting effect. Generally speaking, the investigations that have contributed most to our knowledge of the differences in the equipment of children have been (a) mental and scholastic surveys of selected child populations; (b) experimental work on specific projects with groups of children using standardised intelligence and attainment tests; (c) case studies of children.

Early experimental work, by making use of objective tests,² was sufficient to begin to reveal that individual differences amongst children were much greater than had hitherto been supposed. The publication in 1917 by Burt of his three memoranda³ did much to emphasize the variations in scholastic attainments of children of school age. His examination, age group by age group, of the standardised attainment test scores of 3,637 boys and 4,009 girls between the ages of five and fifteen, and the comparison of these results with those of 596 pupils of similar ages from special schools showed how wide were the ranges in each age group. By using the average difference between the medians for any two adjacent age groups in terms of standard deviation he was

¹ The School Medical Service came into being in 1907 with a block grant of £3,700, its present cost being over £6,000,000. Those wishing to consider the contribution of this service towards the realization of the need to provide for individual differences in pupils should read the reports of *The Health of the School Child*, H.M.S.O., and the chapter on the School Medical Service in *Modern School Hygiene*, by R. Gamlin (Nisbet and Co.).

² "Experimental Tests of Intelligence," C. Burt, *Br. Journ. Psy.*, III, 1909. "Factors in the Mental Processes of School Children," N. Carey, *Br. Journ. Psy.*, VIII, 1916. And also the work already mentioned (in Part I) of Ballard, Green and Winch.

³ *The Distribution and Relations of Educational Abilities*. Report by the Education Officer submitting Three Preliminary Memoranda by Mr. Cyril Burt, M.A., Psychologist. P.S. King and Son, 1917.

able to show that for the samples tested in say, mechanical arithmetic, "about twenty-three per cent. of the children of a given age are better than the average of the next age above, and nearly thirty-four per cent. are worse than the average of the age next below. Some are even better than the average of children two or three years older."¹ The overlap in other subjects was similarly marked.

The standardisation of the London Revision of the Binet-Simon Scale² further demonstrated the wide differences to be found amongst children in their ability to do mental test items of different kinds. Tables from the analysis of the test results such as the number of children at each age passing the several tests (both in ordinary and M.D. schools), the differences in order of difficulty of the tests for normals and defectives, the average number of tests passed and the variability at each age, the distribution of mental ages in normals and defectives³ all have as a basic common characteristic, the variability of children in respect to general and special mental powers. Gradually an increasing number of researches have helped to build up our knowledge of the differences that exist at each age in respect to the intellectual and scholastic abilities of children. Of these the more extensive surveys with particular groups of children or with groups selected from particular backgrounds, have been most valuable. Mention might be made of the work of Godfrey Thomson and his helpers in the use of the Moray House Tests, O. E. Lewis,⁴ Russell,⁵ the Scottish Council for Educational Research,⁶ Gray and Moshinsky,⁷ Cattell,⁸ Frazer Roberts, Norman and Griffiths.⁹

In particular the 1921 and 1922 surveys of Thomson contributed materially, at that time, to our knowledge of the range of general intelligence amongst boys and girls. Thus in the 1922 survey,¹⁰ from an intelligence test given to 13,320 children (approximately equal numbers of boys and girls) between the ages of eleven and thirteen in Northumberland elementary schools, we learnt that there was this kind of distribution:

¹ *Mental and Scholastic Tests*, C. Burt. Memorandum II, p. 69.

² *Mental and Scholastic Tests*, C. Burt. (P. S. King and Son, 1920.)

³ See in particular Memorandum II on the Theoretical Validity of the results in which these and many other psychological questions are examined, and which in themselves constitute an early essay on the psychology of individual differences.

⁴ Report on an Investigation into Incidence of Mental Deficiency in six areas 1925-27, E. O. Lewis, Part IV *Report of the Mental Deficiency Committee*, 1929, H.M.S.O.

⁵ "Measurement of Intelligence in a Rural Area," J. B. Russell (*Br. Journ. Psy.*, Vol. XX, Jan., 1930).

⁶ *Intelligence of Scottish Children: A National Survey of an Age Group*. Scottish Council for Educational Research, 1933 (Univ. Lond. Press).

⁷ *The Nation's Intelligence*, J. L. Gray. Gray and Moshinsky tested over 10,000 children from primary, central, secondary and private schools in London.

⁸ "Standardisation of two Intelligence Tests for Children," R. B. Cattell (*Br. Journ. Psy.*, Vol. XXVI, Jan., 1936). *The Fight for our National Intelligence*, R. B. Cattell (P. S. King, 1937).

⁹ "Studies on a Child Population, III," J. A. Frazer Roberts, R. M. Norman and Ruth Griffiths. (*Annals of Eugenics*, Vol. VIII, 1938.)

¹⁰ "The Social and Geographical Distribution of Intelligence in Northumberland"; J. F. Duff and G. H. Thomson (*Br. Journ. Psy.*; Vol. XIV, Oct., 1923).

See also "The Standardisation of Group Tests and the Scatter of Intelligence Quotients," G. H. Thomson (Part I and II, *Br. Journ. Educ. Psy.*, Feb. and June, 1932).

I.Q. of	Girls. per cent.	Boys. per cent.
140 or over	0.06	0.17
130—139	0.73	1.16
120—129	4.75	5.97
110—119	17.12	16.25
100—109	26.4	26.45
90—99	26.5	25.4
80—89	14.8	14.17
Below 80	9.61	10.45

Apart from demonstrating the range of individual differences in children of 11+ to 13+, such distributions have had significance for educational administrators in their planning.

In the Scottish Research Council's survey 44,210 boys and 43,288 girls, belonging to the age group 10—11, were given a group test of intelligence while 500 boys and 500 girls were given an individual (Terman-Binet) test. These results contributed further information on the differences of individuals. In so far as the children were all of one age group the results have far-reaching educational implications.

Apart from the significance of the distributions, particularly at the top and bottom intervals, the survey definitely established the fact that the intelligence quotients of boys are more widely scattered than those of girls. The samples of the 500 boys and 500 girls, given the individual tests, yielded standard deviations of 17.4 and 16.1 respectively. This was confirmed in the group test where the S.D.s were, boys 15.93 ± 0.04 , girls 15.02 ± 0.03 , with a difference of 0.91 ± 0.05 , eighteen times its probable error and, therefore more than a thousand million to one chance that the error is due to any bias in sampling.

Further evidence of the wide ranges in attainments,¹ initially revealed by Burt and early workers, had been produced during educational surveys or planned experiments. Thus the application in one borough² of a graded word reading test, as a preliminary means of discovering backward children at various age levels, showed these variations:

	Years Retarded					No. of children Normal attainment.	Years Advanced				
	5	4	3	2	1		1	2	3	4	5
Age 7..	—	—	—	35	123	365	250	157	87	41	25
Age 11..	4	12	28	50	98	502	320	274	168	—	—

¹ This is true even of speed and quality of handwriting. See "An Investigation between Rate and Quality of Handwriting in the Primary School," A. R. Wills, *Br. Journ. Ed. Psy.*, Vol. VIII, Nov., 1938.

² Taken from *The Education of Backward Children*, p. 11, M. Hill (Harrap and Co., 1939).

Results like these (similar in other subjects from other investigations) afford an excellent example of how educational research can help to influence educational practice. In this instance the objective evidence of the wide range of reading ability in junior school age groups has contributed materially towards causing many teachers to abandon the unitary 'one track' class reading lesson, so common twelve to fifteen years ago, in favour of section, group or individual methods of teaching.

Tables of intercorrelations between various school subjects, at both the primary and secondary school levels, together with numerous case studies of pupils, have confirmed also the variability of pupils from subject to subject.¹

In general, research has shown that differences in native intelligence increase as pupils get older—a point of importance to those concerned with provision for post-primary education. Furthermore, the longer pupils are at school the wider becomes the range in their educational attainment—educational influences increase natural differences in ability.²

IV.—MENTAL DEVELOPMENT IN CHILDHOOD AND ADOLESCENCE.

Perhaps no field of research is as important to educators as that which deals with the mental life and needs of the pupils in our schools. The more reliable information we have about the mental characteristics of pupils—their personal and social needs at different chronological and mental age levels—the better *should* be our curriculum planning and our choice of teaching methods. The influence of reliable research results has already shown itself in the immense improvements in many nursery and infant schools in this country.³ There has been a considerable volume of careful observation and experiment on most aspects of mental and social development in young children, i.e., up to the age of six.

Outstanding in this country has been the work of Isaacs⁴ and Valentine.⁵ Isaacs' publications are based upon records of work carried out at the Malting House School for young children between 1924 and 1927, upon extensive clinical practice and on evidence from young children observed during war evacuations.⁶

¹ In his work at Kirkcaldy High School Earle has recorded the progress of pupils in various subjects in relation to intelligence and to subsequent examination successes which aptly illustrates the individual variations, from time to time, of pupils in different subjects. See *Reconstruction in the Secondary School*, F. M. Earle (Univ. Lond. Press).

² See "Progress through a Secondary School as Measured by School Marks, F. Sandon (*Br. Journ. Educ. Psy.*, Vol. III, 1935). Relevant information is also available in sections of *Achievement Tests in the Primary School*, G. Macgregor, 1934; *Tests of Ability for Secondary School Courses*, F. M. Earle, 1936; *Selection for Secondary Education*, W. M. McClelland, 1939; Publications of the Scottish Council for Research in Education (Univ. Lond. Press).

³ Not, of course, entirely due to research in this country, but combined with that of workers like Gesell and his colleagues, Shirley, Baldwin, Blatz, Dearborn, Kellog, Blanton, Bühler and Watson.

⁴ *Intellectual Growth in Young Children*, 1930, and *Social Development in Young Children*, 1937, S. S. Isaacs (Routledge and Co.). See also *The Psychological Aspects of Child Development*, S. Isaacs (Evans Bros.), a reprint from the 1935 *Year Book of Education*, a very useful summary of methods and findings (up to 1935) of the psychology of infancy and early childhood. Of use also to general readers is Mrs. Isaacs' extremely sound and readable little volume, *The Nursery Years—The Mind of the Child from Birth to Six Years* (Routledge and Co.).

⁵ *The Psychology of Early Childhood*, C. W. Valentine, 1942 (Methuen).

⁶ *The Cambridge Evacuation Survey*, Ed. Susan Isaacs, 1941 (Methuen).

Valentine's continuous research into the mental development of young children, reported from time to time in journals, reached its fruition in 1943 with the publication of what may be regarded as a standard work—*The Psychology of Early Childhood*.

Of other workers in this field, there have been important contributions from Bridges,¹ Bowley,² Lewis,³ Burlingham and Freud,⁴ and Blatz,⁵ while many single pieces of work on particular topics⁶ have all helped to build up an effective body of knowledge concerning the mental life of young children.

The main general form of the advance that has taken place in this part of the field has been the gradually increasing emphasis placed on the first five to six years as formative years. Research workers have produced evidence which has thrown up into sharp relief the claims of the young child to be considered as an individual whose education at the two to five stage needs to be properly planned for in nursery schools or nursery classes.⁷

Briefly the more detailed characteristics and needs of young children indicated in the research findings are (a) the need for security⁸; (b) the mental, physical and social value of play⁹; (c) the need for contact with other children, both younger and older, to promote maximum intellectual and social growth¹⁰;

¹ *Social and Emotional Development of the Pre-School Child*, K. Bridges (Kegan Paul, 1931).

² "A Study of the factors influencing the general development of the child during the pre-school years by means of Record Forms," *Monograph Supplement, Br. Journ. Psy.*, Vol. VIII, No. 25.

³ *Infant Speech*, M. M. Lewis (Kegan Paul).

⁴ *Young Children in War-time in a Residential Nursery School*, D. Burlingham and A. Freud (Allen and Unwin, 1942). *Children without Families*, D. Burlingham and A. Freud (Kegan Paul, 1942).

⁵ *Understanding of the Young Child*, W. E. Blatz (Univ. of Lond. Press, 1944). Blatz's book was based on research carried out in Canada, but in so far as it was partly written in this country while he was actively connected with the Garrison Lane Nursery Training School, Birmingham, some of the material contained in it reached its final form through additional observations and experiment in this country. In fact, there are numerous references to children at the Birmingham Training Centre.

⁶ Examples of these are: "Language Tests on Pre-School Children," A. E. Smith (Ed.B. degree thesis, Glasgow, 1930); "The Development of a Child's Speech," J. Hunter (M.Ed. thesis, Manchester, 1932); "Emotional Development in Children," E. H. Wilson (Ph.D. thesis, Univ. of London, 1934); "Children's Thinking," V. Hazlitt (*Br. Journ. Psy.*, XX, 1929); "A Study of Imagination in Children of five years old," (Ph.D. thesis, Univ. of London, 1931).

⁷ Research has indicated that all children of the age range 2-3 to 5, from all kinds of backgrounds, need something like the opportunities provided by a good nursery class or school.

⁸ "The Incidence of Neurotic Symptoms among Evacuated School Children," C. Burt (*Br. Journ. Educ. Psy.*, X). Includes also a useful bibliography on the effects of evacuation on children. "Some Notes on the Incidence of Neurotic Difficulties in Young Children," S. Isaacs (*Br. Journ. Educ. Psy.*, Feb. and June, 1932). See the section on environmental influences. *The Psychology of the Unwanted Child*, A. Bowley, Chaps. II and III has information on children showing difficulties due to loss of security.

There is evidence from a follow up after eighteen months "A follow up Study of Emotional Symptoms in School Children," J. D. Cummings, *Br. Journ. Educ. Psy.*, Nov., 1946) that emotional difficulties at the two to five stage fade out considerably as the child gets older. Fears and anti-social behaviour; nervous habits go relatively quickly; day-dreaming and lack of concentration are more resistant to change. The period is one of instability and if children get other child contact they work out their own therapy.

⁹ See in particular Valentine's chapter on the beginnings and significance of play, Chap. IX, in *The Psychology of Early Childhood*. Also *Play in Childhood*, M. Lowenfeld. "A Study of Children's Activity with Plastic Material and Some Interpretations of Play in Infancy," E. M. Hall (M.A. thesis, Univ. of Birmingham. Reported in *Br. Journ. of Educ. Psy.*, Nov., 1939.)

¹⁰ An interesting account of a five-year experiment in a class of forty children, ages three to seven years, in which child relationships were made major determinants in character formation, is briefly reported in the *New Era*, June, 1946. See *The Family Class*, K., Bartlett.

(d) the importance in these early years of consciously arranging conditions to promote and encourage initiative, self-confidence and independence, and conversely the deep and lasting effects of adverse emotional influences on the aspects of personality¹; (e) that anger, defiance, destructiveness and jealousy are expressions of all children and are part of natural development; (f) the need for a settled framework of routine and order with freedom within that framework; (g) the importance of regarding the child as a rational being—a rapidly developing intelligence and power to reason, with desires, wishes and fears of real significance for his development.

Turning now to the years covered by the period six to eleven, we do not find any genetic studies similar to those at the earlier stage nor has there been a composite publication in this country like that recently reported by Gesell and his co-workers in America. In 1931 Burt published in the *Primary School Report*² a memorandum on the mental characteristics of children between the ages of seven and eleven; but this very useful survey reports very few researches at the junior school stage.

A review of the available research material (mostly in the form of unpublished theses in University libraries) reveals a somewhat unco-ordinated set of investigations into some aspects of mental development at the primary school stage. Briefly, the findings about the mental characteristics of children between the ages of six and eleven, from actual experiments and from reports on experimental teaching methods in progressive schools, may be summarised under five major headings.

(1) *Continuing development in intellectual power and in reasoning ability.*

Evidence shows that individual differences in general intelligence³ are becoming somewhat more marked. At 10+ and 11+ the range is wider than at 6+ or 7+ and necessitates finer grading and more sections or sub-divisions within classes. Experimental work on children's reasoning power at this age range emphasises the fact that reasoning is much dependent on intelligence and experience. Nahapiet's study⁴ also draws attention to the importance of the level of language ability as a factor in reasoning.

Burt had already emphasised that, "contrary to earlier presuppositions, the elementary mental mechanisms essential to formal reasoning are present before the child leaves the infants' department, i.e., by the mental age seven. Development consists primarily in an increase in the extent and variety of the subject matter to which those mechanisms can be applied." Burt makes the appeal that with able pupils of 9+ and 10+ more note should be taken of their powers of reasoning—there are, however, still many junior schools where

¹ See *Children without Families*, D. Burlingham and A. Freud (Kegan Paul, 1944) "Emotional Symptoms in School Children" (*Br. Journ. Educ. Psy.*, Nov., 1944).

² *The Primary School: Report of the Consultative Committee*, Appendix III, C. Burt (H.M.S.O., 1931).

³ See "The Growth and Variability of Intelligence," C. A. Richardson and C. A. Stokes (*Br. Journ. Psy. Monographs*, No. 18).

⁴ "The Use of Standardised Tests in Recording the Mental Progress of Elementary School Children," R. Williams, M.A., thesis, Univ. of Liverpool (1935).

⁵ "Reasoning in Children from Seven to Eleven Years of Age," K. Nahapiet, M.A. thesis, Univ. of Birmingham (1933). Supplementary information is also to be found in "A Reasoning Test in Intelligence," A. M. Black, B.Ed. thesis, Univ. of Glasgow (1933).

"An Analysis of Reasoning Ability in School Children," J. H. Murdoch, Ph.D. thesis, Univ. of London (1933).

"The Psychology of Reasoning with Special Reference to Educational Problems," E. V. Staynor, M.A. thesis, Univ. of London (1932).

"The Effect on General Reasoning Ability of Training in Functional Thinking Arithmetic," M. Williams, M.A. thesis, Univ. of London (1938).

The Primary School Report, Appendix II, p. 266, C. Burt (H.M.S.O.). See also

the brightest pupils are "under taught," in respect to tasks that really stretch their reasoning powers. There is too the need to realise that we assist pupils' ability to reason by extending their experience. Very often the pupil is held up in his problem arithmetic, not because of lack of intelligence, but because of the lack of experience (perhaps because we still use forms of problems which are foreign to the pupil's experience and which should be omitted from the arithmetic syllabus).

- (2) *Increasing strength of imaginative powers, particularly at the 9+ and 10+ levels, as revealed in art, craft and dramatic work, coupled with relatively high levels in aesthetic appreciation.*

Experimental data show that there is strong creative imaginative power in children of nine to eleven years. This power, which shows itself in such expressional fields as those of art, craft, drama, literary and poetic composition,¹ and even dance and music, appears to be much less dependent upon intelligence than upon opportunity to play with materials, and encouragement to try out things, provided there has been some previous relevant experience in the field on which the children can build. Individual records of children and descriptions of experimental work in schools,² which afford an atmosphere conducive to imaginative expression, yield ample evidence of original composition and individual interpretation.

In aesthetic judgment there is also in junior school pupils a strong appreciation of essentials in rhythm, colour, design, pattern and form—stronger, in general, than at the eleven to thirteen year levels.³

- (3) *An increasing need for a sense of achievement.*

Observations and case studies of pupils from 6+ or 7+ to 11 years show that the emphasis in the earlier part of this stage is more markedly in terms of individual achievement, supplemented by the need of approbation from those in authority. It is not until towards the end of the junior school range, at 10+ and 11+, that, in general,⁴ there is much sensitivity to group requirements or group influences.

Research work in junior schools has shown the adverse effects upon many children of intense competition within the large group, and of the uselessness of demanding greater efforts in terms of group standards. Better results have been obtained, particularly with children of average and below average intelligence, by individual progress charts and records, by competition within

¹ Consideration of experimental work in this field together with its educational implications is to be found in *The Language and Mental Development of Children*, A. F. Watts (Harrap and Co.).

² See, for example, accounts of experiments in schools, recorded from time to time in *The New Era in Home and School* (New Education Fellowship, 1, Park Crescent, London, W.1.). The influence of teachers of Art like the late Marion Richardson has helped towards a recognition of this creative power in junior schools. See *The Teaching of Art in Schools*, Evelyn Gibbs, based on experimental work in schools, and the recent report of the Ministry of Education (Williams and Noregate), *Art Education*, pp. 8-12 (H.M.S.O.).

³ Margaret H. Bulley's experimental work, "An Enquiry as to Aesthetic Judgment in Children (*Br. Journ. Ed. Psy.*, June, 1934) bears this out.

⁴ There is always a danger in considering the characteristics of children grouped in age ranges or periods to overlook individual differences. Age distinctions have an arbitrary flavour and research reveals that mental and physical development of children pursues a gradual continuous course without any very marked steps or stages. Each new ability, each new accomplishment is led up to fairly gradually and one step or change in the acquisition of a skill or the development of a characteristic merges almost imperceptibly into the next. Nevertheless, there are marked differences in mental characteristics between seven-year-olds and ten-year-olds, between the ten-year-olds and thirteen-year-olds, and the most satisfactory curricula and methods take note of these.

small groups,¹ and by use of methods² to enable *all* children to make an effective contribution, which in itself helps towards greater social and emotional maturity.³ The intimate relationship between the child's mental health and behaviour⁴ and his progress in school has been adequately demonstrated through the many case studies that have been made of the children at this stage.⁵ Deterioration in the personality development of backward children has further stressed the far-reaching influence of lack of success. Records kept of children in special classes for retarded pupils have strikingly revealed the improvement in personality adjustment when provision is made for individual achievement, even within the limits of severe intellectual handicaps.

(4) *Increased intellectual curiosity.*

The limited studies of children of the seven to eleven period leave no doubt that a growing intellectual curiosity—as revealed in questions asked, in reading associated with interests, in a desire to experiment with things and to go and explore—is a tendency of increasing strength in this period. There is, however, insufficient information of a genetic kind relating to groups of children of varying backgrounds and intelligence levels on the development of intellectual interests, yet this is most necessary if we are to obtain adequate supplementary information on which to base effective allocation for different forms of secondary education. The clue to one aspect of selection may be through enriching the junior school curriculum to stimulate and to provide for much richer and more varied interests. Studies of my own children reveal the astonishing amount of knowledge that is assimilated in pursuit of interests, adroitly and skilfully fed with material of the right kind at the right time.

(5) *A need for physical activity and rhythmic repetition.*

Limited experimental work has begun to reveal how these can be the bases for so much social, intellectual and aesthetic development.⁶ Linked with these are other characteristics of vital emotional and educative value, namely the junior school child's desire to *collect things* and *make things*.

All studies of children at this stage, whether as individuals or in groups have revealed the importance of emotional attitudes as powerful influences in determining the degree of learning and the nature of behaviour. Wide differences in temperament, which parallel those in general intelligence, indicate the importance of careful consideration of the emotional reactions of children

¹ See "The Individual and the Group in Education," W. J. Wheeler, M.A. thesis, University of Birmingham (1935).

² The project method or use of a centre of interest has demonstrated the need for provision of achievement through interests—see a recent account in *Activity in the Primary School*, M. E. Daniel (Basil Blackwell).

³ The social effects of certain educational methods have been stressed in C. M. Fleming's review of research results in a *A Social Psychology of Education* (Kegan Paul), and *Research and the Basic Curriculum* (Univ. of Lond. Press).

⁴ A useful analysis of this aspect of the problem is to be found in "The Psychological Needs of Children and their Relation to Behaviour," C. Sanders, Ph.D. thesis, Univ. of London (1938).

⁵ In addition to published studies such as those in *The Young Delinquent*, C. Burt; *The Backward Child*, C. Burt; *Experiments in a Backward Class*, E. A. Taylor; *Backwardness in the Basic Subjects*, F. J. Schonell; there is a wealth of evidence of this kind in the files of Child Guidance Clinics and in the reports on results of subsequent remedial work.

⁶ So far research in this field has had little influence on school curricula, and many thousands of boys and girls are deprived of the stabilising influence of movement to music. In one junior boys' school where records were kept (with a control group), during a year's course in rhythmic work there were significant gains by pupils in co-ordination and emotional stability.

in helping them towards natural development. Just as the personality formation of the child at home is dependent upon adequate emotional responses deriving from parental attitude and guidance, so much of the learning of children in school is dependent upon adequate emotional responses deriving from teacher guidance.¹ But research work in schools shows that an effective teacher endeavours to plan the situation and arrange the environment to produce satisfying emotional responses. The grading of work to provide for success, free activity periods at the beginning of the day, hobbies periods to pursue interests, group work through which small teams can gather information, appraisal of work in relation to effort made and in relation to ability, the absence of corporal punishment and of sarcastic or disparaging remarks, these and many other conditions have been used with proven effect, to produce satisfactory emotional responses, so vital to development and stabilisation.

An examination of research literature relating to adolescence and education shows again the lack of genetic studies and the incompleteness of research in this field. Space does not permit more than a brief reference to results. Most investigations have revealed that although adolescence need not be regarded as the period of "storm and stress" so strongly advocated by earlier psychologists, yet it is a period, particularly the thirteen to sixteen years, of fairly intense emotional reaction for many children.² What we have learnt is that, at say fourteen or fifteen, the individual differences in intelligence, in physical maturity, in temperament, in attainment, in social maturation, are immense and that the emphasis needs, therefore, to be on the individual rather than on the group. Many of the psychological changes which were supposed to blossom with startling suddenness and intensity, as a direct and necessary accompaniment of adolescence, are now known to be largely socially determined.³ And there is no doubt that many of the disturbances and difficulties which were assumed to be intrinsic to the adolescent stage are in themselves the direct outcome of frustrating and conflicting environmental conditions. Growth, *in the main*, follows a continuous and consistent pattern without spurts or

¹ There is also the obvious inter-relationship of home and school, and behaviour and attitude in the one is determined to an appreciable extent by behaviour and attitude in the other—adults and other child members who influence the child in the home circle extend their influence to the school and *vice versa*. It is important, therefore, that there should be much greater understanding between home and school, but insufficient has been done in this country to investigate the exact effects of these reciprocal situations one on the other, or to foster a better understanding between the principals in the two arenas. (See for an experimental investigation of one aspect of the problem "The opinions of teachers on Parent-Teacher co-operation," W. D. Wall, *Br. Journ. Educ. Psy.*, June, 1947). Quite recently my examination of an unruly pupil revealed clearly how home and school should know of and be able to judge conditions existent within each other's sphere of influence. The pupil, a girl aged 11½, had lost her mother and, with the help of the father and part-time domestic help, was helping to bring up her younger brother and sister. At home she was a model of responsibility and reliability, but the conditions were too severe for her and she was living a life unnatural to her age, with the result that the tension was relieved by "letting off steam" in school in the form of harmless but irritating conduct shown in her naughtiness, irresponsibility, unreliability and inaccuracy in class.

Recently Highfield has shown, from experimental work in Leicester, the great value of a psychiatric social worker acting as "a go-between" home and school in respect to an adjustment class for pupils who required some assistance in making adjustments between home and school conditions. See *The Young School Failure*, M. Highfield (Oliver and Boyd, in the press).

² "A Critical Analysis of recent investigations into the Psychology of Adolescence," D. M. Riddell (M.A. thesis, Univ. of London, 1936).

³ Here anthropological studies have helped the psychologist. See *The Coming of Age in Samoa and Growing up in New Guinea*, Margaret Mead. Two useful summaries dealing with adolescent education, and which stress social influences in the formation of adolescent characteristics are to be found in *Growing up in a Modern Society*, Marjorie Reeves (Univ. of Lond. Press); *In the Service of Youth*, A. McAllister Brew (Allen and Unwin):

regressions, without explosive emotional changes. Nevertheless, there is no doubt, from experimental work and from case studies, that the boy or girl at fourteen or fifteen is a very different individual from the boy or girl at ten, and that he or she has special needs to be satisfied. There has been an immense step forward in development in the vast majority of cases, except where intense physical or emotional conditions have prevented further maturation. The young adolescent now wishes to be considered as an individual with opinions, knowledge, ideas of his own,¹ and there is a stronger desire for freedom and independence (not understood by some parents and teachers). There are some mental accompaniments to the physical changes in the growth of the long bones and in the maturation of the reproductive organs, and the accompanying emotional attitudes thus produced need careful consideration—the gaucheness and inco-ordination of many young adolescents at this time, their liability to fatigue, their inaccuracy in mechanical work—need to be taken into account in helping them over a period of self-consciousness or a feeling that they cannot reach adequate standards. The adolescent's questioning of things previously accepted, his desire to know about things² and to try out his own knowledge, linked with his sensitivity to group opinion, especially that of his fellows, makes handling him a task requiring considerable tact, sympathy and knowledge of individual differences. These changes together with an instability of interests in adolescence make it necessary to frame our curricula, our teaching methods, our organization of youth centres and youth service³ in close account with the mental characteristics of this stage of development.⁴

The great increase in delinquency at the early adolescent stage is in itself evidence of the emotional sensitivity of the age—the peak period of delinquency in many areas is 13+, still within the school years and relating largely to the less able pupils. There is a strong urge in young adolescents who are failing, to obtain adequate compensatory satisfaction through anti-social acts. We have obtained not a little of our psychology of adolescence from studies dealing with delinquency⁵ at this period.

¹ These needs are clearly examined in that excellent study by A. E. Morgan, *The Needs of Youth and the Young Citizen* (Pelican Library). See, too, *Girls Growing Up*, A. P. Jephcott, based on enquiries from adolescent girls in their attitudes towards schooling, social and economic matters.

² The immense success of discussion groups, youth parliaments, enquiries from first hand sources and techniques of the brains trust type with adolescents are evidence of the need for a change in method to fit in with changes in mental attitude. Interesting information on the results of a change in methods is given in an account of experimental work, carried out under the Stead Memorial Fund, in secondary schools in Chesterfield—“The Relation between Interest, Aptitude and Achievement—An account of a curriculum experiment in four secondary modern schools,” M. Uprichard (Ph.D. thesis, Univ. of London 1947).

³ An examination of the problems of youth service is made by C. W. Valentine and Olive Wheeler in the *Br. Journ. Educ. Psy.*, June, 1943. Both articles contain reference to research findings on adolescent psychology and their significance for youth organizations.

⁴ As R. A. C. Oliver points out in his book *Research in Education* (Allen and Unwin), the everyday work of teachers forms a vital link in research, and much illuminating information may come from co-ordinated experimental work (not necessarily objectively assessed) in schools. Thus descriptions of the organisation and methods in schools, such as Bedales, Dartington Hall, the Perse Schools and Bishop Wordsworth's School, are in themselves pieces of research into adolescent needs.

⁵ Burt's *Young Delinquent* (Revised edition, Univ. of London Press), is an excellent volume on the psychology of adolescence, particularly rich in case studies which reveal the interplay of forces, intellectual and physical, emotional and environmental, in the formation of adolescent attitudes. See also *The Psycho-Analytic Study of Delinquency*, K. Friedlander (Kegan Paul). Equally useful are accounts of re-educative work with delinquent adolescents—*The Hawkspur Experiment* and *The Barns Experiment*, Wills (Allen and Unwin)—these reveal the passionate desire of the adolescent to establish himself, to gain a measure of psychological independence and to be thought well of by others.

Research results into mental characteristics of adolescence¹ give, so far as they go at present,² an indication of the need for those personal qualities in teachers that will enable somewhat uncertain adolescents to develop in an atmosphere which provides both freedom and security and which enables them to strengthen themselves psychologically through discussion and discovery.

IV.—THE MEASUREMENT OF INTELLIGENCE.

The measurement of intelligence is a matter of very great importance for education, and considerable attention has been devoted to intelligence testing—no fewer than 118 of the 755 theses presented at British Universities for higher degrees, during the period 1918—1943, were on intelligence tests (see Blackwell's lists as reported in this *Journal*).

As the intelligence test in one form or another, with variations in validity, has been proved, over the last twenty-five years, to be a reasonably accurate instrument for measuring general mental ability there is no need to consider that aspect of the matter now. What is more pertinent is to review the lines of advance or trends of enquiry that present-day information affords in respect to these measuring instruments. For the sake of brevity I have listed this knowledge as a series of salient points.

Research has revealed, mainly through the use of correlations, analysis of variance, methods of factor analysis, calculation of regression equations and, to a lesser extent, through follow-up studies of individuals, that our answer of "Yes" to the question of "Do intelligence tests test intelligence?" must be supplemented by another question, "And what else?" It has been shown that an intelligence test score is a much more complex result than it was previously assumed. It represents a number of factors some of which have something in common with other factors in other test results, some of which are specific to the test itself, and some of which overlap also in respect to other factors in the single test result. Of course Burt had quite early indicated³ the extent to which school attainments play a part in Binet Scale results. But factorial analysis of test scores⁴ together with statistical studies of validity and self consistency (reliability) have thrown into prominence the need to be cautious in our interpretation of results—that the material of the test, the conditions under which it is given, the varying state of the testees on different occasions,

¹ A summary of the physical and mental characteristics of adolescence with special reference to post primary education, is given by H. A. Harris and Sir Cyril Burt in *The Spens Report* (H.M.S.O.).

² There is great need for the investigation of problems intimately connected with adolescent attitudes and adolescent needs as revealed in the transition from school to work. A number of Professor Hamley's students at the Institute of Education have recently completed research theses on attitudes of adolescents towards certain school and life problems—reference to which will be made in a later section. See also "The Adolescent in the Factory," Cora Tenen (*Br. Journ. Educ. Psy.*, June, 1947) in which the investigator shows how fundamental needs which are not satisfied in factory conditions lead to dissatisfaction and resentment. The psychology of adolescence requires much fuller investigation bearing in mind the problem of transition from school to work, and of the possibilities of psychological change and disturbance at this time.

³ *Mental and Scholastic Tests*, C. Burt (p. 192-3.) See also Appendix VI, p.278 (Second Edition, 1947).

⁴ See, for example, *Intelligence, Concrete and Abstract*, F. Alexander; *Br. Journ. Psy. Monograph Supp.*, No. XIX, 1935; "The Latest Revision of the Binet Intelligence Tests," C. Burt, *Eug. Review* XXX; *An Analysis of Performance Test Scores of a Representative Group of Scottish Children*, G. Thomson (Scott Council for Educ. Res. Publication XVI); "Factorial Analysis of Terman Binet Tests," C. Burt and Enid John (*Br. Journ. Educ. Psy.*, June and November, 1942).

all need to be taken into account in our assessment of the value of the intelligence test findings. It has also been shown how different tests with different kinds of items may give different results.

This recent and more adequate interpretation of intelligence test scores has vital significance for educational practice and planning in which intelligence tests may form an important element in various aspects of prognosis. The emphasis on the composite nature of scores from intelligence tests has led naturally to a more careful examination of other related matters, namely :

- (2) the need for scientifically constructed tests which would give higher validity and self consistency or reliability coefficients,
- (3) the value to be attached to a *single* test finding, particularly in terms of I.Q.,
- (4) the search for other objective estimates to supplement intelligence test findings in the educational field,
- (5) the relation of success in intelligence tests to reading ability,
- (6) the effects of practice in working intelligence tests,
- (7) the constancy of the I.Q.

(2) The demand for scientifically constructed tests has resulted in more careful estimates of the discriminatory value of each test item and of test forms when tests are being compiled. We have adopted for verbal tests the cyclic form, i.e., the continuous set of items with recurring sub-tests. Items have been more carefully selected on the basis of item validation (usually by the upper and lower thirds technique) and sub-tests have been more carefully scrutinised by the use of sub-test intercorrelations and regression measures.¹ Self consistency (reliability) has been determined by various methods such as the split half, parallel test, repetition of the test after an interval, and more recently, as Burt has indicated, by means of the analysis of variance.² The work on test construction has, in general, made users of intelligence tests more conscious of the techniques employed in their compilation, and has suggested to them that in selecting a test for a particular purpose they should note its range and its measures of validity and reliability.³

(3) Obviously the foregoing research into intelligence tests has stressed the need for not placing too much reliance on single test findings for pupils. The effect of this has been that some local education authorities, in using intelligence tests for selection for post-primary education, have introduced two tests given at monthly or three monthly intervals. Furthermore, the pressure to use three intelligence tests at the junior school stage, one of them a non-verbal test at 8+ or 9+, and two verbal tests at the 10+ or 11+ stage is increasing. This should materially assist in the adoption of school record cards.

Finally, this aspect of testing has a bearing on the form in which results are expressed. It would probably be better if all scores were expressed as standard

¹ See, for example, "A Study of Intelligence Test Items," F. N. Nathaniel (B.Ed. thesis, Univ. of Edinburgh). Nathaniel first found the relation between different types of intelligence test questions and head teachers' assessments, and between one type of intelligence sub-test and another, and then by calculating regression coefficients he was able to obtain estimates of the relative values of different types of items. See also "The Correspondence Between Internal and External Criteria in Item Selection," C. A. Smith (B.Ed., thesis, Univ. of Edinburgh, 1943).

² "The Reliability of Teachers' Assessments of their pupils," C. Burt, *Br. Journ. Educ. Psy.*, June, 1945.

³ Reliability coefficients of well constructed tests are usually .92 or more.

scores, and better still if, for some needs, they were given in grades, e.g., on a seven or nine point scale in terms of S.D.¹

(4) That the I.Q. needs to be supplemented by other measures has been stressed in researches, particularly those relating to educational guidance in the school, and to allocation for post-primary education.² At present we do not know the exact value of supplementary measures nor the form they should take.³

(5) The relation of success in intelligence tests to reading ability has also been investigated and this has particular significance in the estimation of the intelligence of dull and/or backward children, or those handicapped by some verbal disability. Studies of the use of performance test scales have relevance to this problem, although the issue as shown in recent work is not a straightforward one. What, however, has been established is that for dull pupils and for backward readers a non-verbal test gives a more reliable estimate of their intellectual powers. Testees with reading ages under $8\frac{1}{2}$ (Mellone⁴ puts the figure at $9\frac{1}{2}$) should not be given a verbal test of intelligence.

(6) Investigations into the effect of practice in working intelligence tests have shown that practice affects test results, particularly between the first and second application of tests and also in respect to certain types of test items; thus the coaching influence is greater with number series than with analogies or classification sub-tests. In general the effect of practice is greater with more intelligent children and is greater with non verbal than with verbal tests.⁵ The introduction of a practice test, to offset to some extent previous acquaintance with tests, is becoming increasingly common.

But another aspect of this problem that has not been fully investigated is the influence of the acquisition of a technique in doing intelligence tests,⁶ or as Vernon puts it, "the nature of intelligence test sophistication."⁷ It is possible that in addition to the effects of practice proper, some testees may acquire a technique in doing intelligence tests and that this may be related to the form, setting and the language of group tests. This, and the effect of practice, require further investigation.

(7) All the above-mentioned points have a bearing on data relating to the constancy of the I.Q. That the I.Q. has certain weaknesses as a measure (more particularly with testees of C.A. 12+ and over) is now admitted, but in general it is still extremely useful for educational purposes. There is considerable

¹ For a most useful consideration of a related problem, namely mental age as a unit of measurement, see the new material in Appendix IV (p. 439) of the second edition (1947) of *Mental and Scholastic Tests*, C. Burt (Staples Press).

² As in the symposium on secondary school selection in recent numbers (June and November, 1947) of this *Journal*, and in "The Education of the Young Adolescent—the Psychological Implications of the Norwood Report, C. Burt (*Br. Journ. Educ. Psy.*, Nov., 1943). "Selection for Secondary Education," A. Sutcliffe and J. W. Canham (Murray, 1944).

³ *Selection for Secondary Education*, W. McLelland, Scottish Educ. Research Publication.

⁴ "An Investigation into the Relationship between Reading Ability and I.Q. as measured by a Verbal Group Intelligence Test, M. A. Mellone (*Br. Journ. Educ. Psy.*, June, 1942).

⁵ "Effects of Practice Upon Intelligence Tests," K. J. Dave, (*M.A. Thesis Univ., London, 1938*).

⁶ "The Application of Six Group Intelligence Tests to the same Children and the Effects of Practice," A. G. Rodger (*Br. Journ. Educ. Psy.*, Nov., 1936).

⁷ "Intelligence Test Sophistication," P. E. Vernon, (*Br. Journ. Educ. Psy.*, Nov., 1938). Vernon, also includes in his book, *The Measurement of Abilities* (Chapters IX and X) an excellent discussion of problems associated with the use of intelligence tests.

constancy of the I.Q.¹ when tests employing similar media are used and when no extreme influences of an emotional or physical kind are present.

Research evidence again points to the need for supplementary data regarding a testee's general cultural background, his experiences, and his language ability. More research is required into the conditions producing variations in the intelligence scores of the same testees.

With the volume of research, now considerable, indicating the great value of intelligence tests for prognostic purposes in education and for clinical use, there is no need to deal. Careful observers like Burt and Thomson have stressed the predominant value of standardised tests of general intelligence in the extensive and important matter of allocating children to different forms of post-primary education.²

Finally, from an educational viewpoint, it may well be that a judicious use of individual tests such as the Terman Merrill will give us for record card purposes, not only useful information on special abilities and disabilities, but also on temperamental traits.³

(Part III will appear in the June number of this Journal.)

¹ Indications of this were early given by Gray and Marsden retesting a group of children with the Stanford Binet Test between the years 1920 and 1925. See "The Constancy of the Intelligence Quotient," P. L. Gray and R. E. Marsden, *Br. Journ. Psy.*, Jan, 1923, Oct., 1924, and July, 1926. The results of these investigations, though useful, do not appear to have been based on sufficient cases, especially at upper and lower levels. Recent work indicates that the I.Q. is more liable to variation at the higher ranges—the Terman Merrill reliability coefficient for I.Q.s 130 and over is .898, P.E. 3.5; for I.Q.s below 70 it is .982, P.E. 1.5.

On the other hand repeated tests over a considerable period with children of low I.Q.s, 50-80, tend to show a fairly consistent decrease. Phillip's data from 365 children tested over the period 1929 to 1938—with a mean of 3.5 testings for each pupil—showed that the correlation between mean length of interval and mean loss in I.Q.s is $.81 \pm .086$. Of course this observed loss may have been a product of the special school experience itself. (The Constancy of the I.Q. in Subnormal Children), G. E. Phillips, *Aust Council for Educ. Research*, 1940.

² A recent survey of the constancy of intelligence test scores within the secondary school is given by F. M. Earle in "The Constancy of Intelligence Test Scores within the Secondary School," *Occupational Psychology*, Oct., 1947).

³ See a suggestive thesis, "The Diagnostic Significance of the Terman Merrill Scale" M. Highfield, M. A. Thesis, Univ. of London, 1945.

SYMPOSIUM ON THE SELECTION OF PUPILS FOR DIFFERENT TYPES OF SECONDARY SCHOOLS.

III.—A METHOD OF ALLOCATION USED IN A COUNTY BOROUGH.

By V. J. MOORE
Director of Education for Walsall.

I.—*Preamble.* II.—*General statement of method.* III.—*Allocation of places to contributory schools.* IV.—*Award of places.* V.—*Detail: (a) Standardization; (b) Age allowance; (c) Timing.* VI.—*Correlations.* VII.—*Summary.*

I.—PREAMBLE.

I AM glad to be asked to contribute to the symposium on the selection of pupils for different types of secondary schools. When the series is complete it will provide valuable data for the solution of this problem, which in recent years has exercised the minds of educationists perhaps more than any other. Every conscientious administrator must have been considerably disturbed from time to time when he has realized the imperfections of every method of selection; and the problem has been by constant study and experiment to try to find some method whereby the flaws are reduced to a minimum.

Sir Cyril Burt and Dr. Alexander have each given a scholarly analysis of the general problem and made practical suggestions. It is my task to give an account of a method which has been adopted in this area during the last few years for the selection of pupils for secondary education of the grammar school type. At the present stage it would be foolish to claim more for this method than that it is an experiment which has produced some interesting results, and that in the opinion of the staffs of both contributory and receiving schools it fulfils its function better than any of the more usual methods which have previously been used in this area.

Each year since this method was first tried, some improvement has been effected, as a result of experience, and there is little doubt that further improvements will follow, probably, for example, in the more systematic assessment of the qualities of temperament and personality to which both Sir Cyril Burt and Dr. Alexander have referred.

II.—GENERAL STATEMENT OF METHODS.

The method used in Walsall for the selection of pupils for secondary school education of the grammar school type is one which was first adopted in 1944 and has been followed since that year. It is designed to reduce some of the evils attached to the ordinary competitive examination, such as strain on the children (and even on the teachers), cramping and distortion of the curriculum, and the unfair advantage to be gained by special coaching.

The arrangements adopted are based on the suggestions made by Professor C. W. Valentine in a booklet, *Examinations and the Examinee*.¹ One main object of his scheme, in addition to those just mentioned, was to make available as a basis for selection, the school records and reports of the junior schools, without the insuperable difficulty of comparing the reports of one head teacher with those of others adopting different standards.

Briefly, the scheme is that to every school where there are candidates for grammar school places, there is given an *allocation* of places based on a series

¹ Published by The Birmingham Printers, 1938.

of general intelligence tests taken by all candidates in the area, and once the *allocation* is fixed the *actual award* of the places is made by the school attended by the candidates in accordance with the procedure to be described later in this article ; thus the head master of school X may be told that his quota is seven places ; the task is then to select the seven pupils in school X who, judging by their primary school records, by their performance in a simple form of internal examination, and of course by the results of the intelligence tests on which the allocation was based, would profit most by grammar school education.

The detailed arrangements for allocation and award were worked out with Professor Valentine and the head teachers of all the schools concerned, and are as follows :

III.—ALLOCATION OF PLACES TO CONTRIBUTORY SCHOOLS.

The allocation of grammar school places to primary schools is determined by the results of two general intelligence tests which are taken by all candidates with an interval of three weeks between the first and second tests ; the results of the two tests are averaged. The tests are marked under arrangements made by an outside examiner, and the average I.Q. determined on the two tests. The outside examiner then makes the allocation of grammar school places to each primary school which has supplied candidates.

It is somewhat of a drawback that here—as in most other areas in the country—the allotment of special places must be governed by the amount of selective secondary school accommodation in the area, which means that the examiner in making his allotment has to base it, not on the theoretical fitness for the given type of education, as evidenced by the results of the group tests, but on the places available. This defect is, however, common to all methods of awarding special places, so that it is not an argument against this particular method.

In order to make certain that every candidate is familiar with the routine of the Group Intelligence Test, and that none get an advantage through individual coaching, arrangements are also made for every child taking the examination to work a special practice test in his own school a week before the examination. This test is of the same length and the same type as the examination tests proper. While the practice test is being taken teachers may, without unduly disturbing children, point out mistakes which are being made, and after the test has been completed and marked, class teachers run through the tests with the children, calling attention to such things as failure to follow instructions, the necessity for not spending undue time over a question which presents difficulty, and so on. In addition, on the day of the examination, immediately before the test proper takes place, all the candidates complete a short practice test which has the effect of making them feel at ease in the somewhat unnerving circumstances of a strange environment—much on the lines of a preliminary “ knock-up ” at tennis. It is impressed on the schools that no other practice in intelligence tests should take place—and, in fact, such practice is to be condemned, not only because it is an attempt to obtain an unfair advantage, but even more perhaps because experiment has shown that coaching beyond the amount given to all our candidates is largely ineffective, and therefore a waste of time.

IV.—AWARD OF PLACES.

The actual award of places (as already stated) is made by the primary schools attended by candidates. The schools know how many selective secondary

school places are available for them, and the award is made on the combined results of (a) the intelligence test—the results of which are given to the schools; (b) a simple form of internal examination—that is, one conducted by the individual schools; (c) the “school order” or “pre-test placing,” which is an order of merit of candidates in each school drawn up by the school staff in consultation. The school order takes into account not only school work during the year, but also such qualities as diligence and interest in work, conscientiousness, trustworthiness, ambition and initiative. This “school order” is determined before the intelligence tests results are known and before any part of the written examination takes place. It is stressed that the internal examination shall be uncomplicated; although head teachers are allowed to use their discretion, something on the lines advocated by Ballard in his *New Examiner* is suggested.

It may be said: “May it not happen that, of two children attending the same school, child X obtains a somewhat higher mark than child Y in the intelligence test and thus earns an allocation of an award to his school, and yet child Y, whose school ranking is high, and whose performance in the internal examination is better than that of X, finally gets an award while X does not?” The answer is that this *may* happen, but that, if it does, Y is presumably on the whole the better candidate, and that the allocation principle has so many advantages that we must face this possibility unless we can find some more satisfactory basis of allocation than by the group intelligence test. In order further to meet this criticism and to reduce the likelihood of such a difficulty arising, the intelligence test marks are weighted by multiplying by three. Thus the relative weights of the intelligence test and the *combined* internal assessment (school examination and school order) are three to two. In fact, in the 1947 examination out of 388 places (201 boys and 187 girls) in selective secondary schools, there were only nine boys and twelve girls who, in the intelligence tests, gained allocations for their schools, but were not finally assigned to selective secondary schools.”

V.—DETAIL.

(a) *Standardization.*

In making the award, standardization is attained by equalising “orders or merit.” Thus (ignoring for the moment the weighting referred to above), in the same school the child who is head of the school list in the intelligence test gets the same marks as he who is head in school order, or in the internal examination; similarly for the second and third places, and so on.

(b) *Age Allowance.*

The table supplied with the Group Intelligence Tests, whereby raw scores are converted into I.Q.s takes into account candidates' ages. In fixing “school order” heads of schools have regard to the ages of candidates (though this must of necessity be on a subjective basis). In school internal examinations there is given an age allowance of 1 per cent. of possible marks for each month by which the candidate's age falls short of the maximum age.

(c) *Timing.*

In order to ensure that a knowledge of the Intelligence Test results shall not influence the schools in deciding on the “school order,” it is arranged that the school order is entered on the schedule of candidates which is sent to the Education Office before the intelligence test is taken. Between the dates when the two intelligence tests are given, and before the results of either of the two

tests is known to the schools, the school internal examination is held, the papers marked, and the order recorded.

VI.—CORRELATION.

Obviously in a method such as this it would be interesting to have some measure of the correlation between the various factors contributing to the final ranking; the correlation coefficients Intelligence Test/School pre-test Placing and Intelligence Test/Final Placing have, therefore, been calculated. In calculating the coefficients the ranking formula $1 - \frac{6D^2}{N(N^2 - 1)}$ has been used.

It will be appreciated that, as the examination is to a considerable extent internal, correlation has to be computed separately for each school; in fact, as boys and girls have separate allocations, we have even to work in separate groups for boys and girls in mixed schools.

Correlation coefficients calculated from the rank formula have little significance when the numbers of cases are small; our calculations have, therefore, been made only where groups of candidates numbering thirty or more are involved.

The following table gives the correlation coefficients calculated from the results of the 1947 examination:

School	No. of Candidates	Coefficient of Correlation between Intelligence Test and :	
		(a) School Record (Pre-test placing)	(b) Combined Result (Final placing)
(1)	(2)	(3)	(4)
A	44	.92	.99
B	43	.77	.98
C	41	.87	.98
D	40	*.41	.97
E	46	.87	.99
F	34	.83	.98
G	34	.80	.97
H	44	.83	.98
I	52	.89	.98
J	30	.65	.97
K	31	.86	.99
L	31	.81	.98
	Averages	0.83	0.98

The coefficient marked with an asterisk is interesting—it is so obviously a “sport” that it has been neglected in computing the average for the column in which it occurs. In order to have further information in regard to this figure which is clearly out of line with the others, the correlation factors, School Internal Examination/School Pre-test Placing, and School Internal Examination/Final Placing, have been calculated for this group of children. They are .50 and .91 respectively. It is interesting to see that while the School Pre-test placing is so much at variance with the Intelligence Test, it is almost equally at variance with the internal examination conducted by the school, and that it therefore has little disturbing effect on the final order.

VII.—SUMMARY.

1.—The scheme described was based on a plan suggested by Professor Valentine to avoid the evils due to pupils from different primary schools competing in an external examination, and to enable school records to be used without the extreme difficulty of assessing the recommendations of one head teacher as against those of others.

2.—All candidates are submitted (after universal coaching) to two intelligence tests. On the basis of these, grammar school place awards are made to each primary school according to the number of its pupils who attain the minimum I.Q. needed to fill the vacant places in the selective secondary schools.

3.—The places allotted to each primary school are then awarded to those of its pupils who score best on the three following: (a) Intelligence tests; (b) school report; (c) school internal examination, (a) being weighted against (b) and (c) in the ratio 3 : 2.

4.—In very few cases does the pupil who wins a grammar school place for his primary school by his score in the Intelligence Test fail to gain entrance to a grammar school. This is borne out by the high correlations between (a) intelligence test orders, and (b) final orders based on tests, school reports and internal examinations. These correlations average 0.98.

The scheme has received practically unanimous support from the heads of all schools concerned, primary and secondary.

THE FUTURE OF MEASUREMENTS OF ABILITIES.

By EDWARD L. THORNDIKE.

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I.—Introduction. II.—Improvements in adequacy. III.—Purity and impurities. IV.—Practical problems of improvement.

I.—INTRODUCTION.

ALL competent students of measurements of abilities will agree that such should possess maximal objectivity, adequacy, and purity. That is, the measurement should, so far as is practicable, be characterized by very small personal equations and close agreement in the scores given to the same examinee by different examiners ; should measure all of the ability in question ; and should measure it uncontaminated by other abilities.

There have been great improvements in objectivity, and the future should add to these.¹ But adequacy and purity should receive much more attention than they have in the past.

The inadequacy and impurity of present alleged measurements of ability in Latin, French, German, music, the graphic arts, etc., is shown by the low correlations between different tests of the same ability. The tests might still be inadequate or impure if they correlated perfectly one with another ; and efforts directed merely toward getting higher correlations among n tests of ability in, say, French, or music, would usually result in making all of them worse than they were before. But if each of two tests measures all of ability A and nothing but A, they will both correlate perfectly with perfect measures of A and with each other. Calling perfect measures of A in a suitable range of persons the criterion scores for A, it is axiomatic that the goodness of any alleged test of A is measured by its validity, i.e., its correlation with the criterion score for A. Among tests equally valid those with *lowest* reliabilities, i.e., self-correlations for alternative forms are the most promising, because their validities can be increased most by combining or lengthening them.

II.—IMPROVEMENTS IN ADEQUACY.

Much work should be done toward clearer descriptions of abilities and closer approximations to perfect measures of them, to be used as criteria to evaluate tests by obtaining from a suitable population scores in the perfect measure and in the proposed test. The great difficulty in devising such approximately perfect measures of psychological and educational abilities arises from the problem of weighting different products, achievements, or behaviours. A jury of experts might agree in describing athletic ability as including ability in running, jumping, swimming, throwing light weights, throwing heavy weights, fencing, wrestling, playing baseball, playing football, playing handball, etc., etc., but disagree markedly in the weights they attached to many of the components. A jury of experts on ability in French would agree in including ability to understand modern written and spoken French, and to write and speak French so as to be understood, and so as not to seem illiterate with respect to grammar and usage. But they might weight understanding and use differently, and comprehensibility and precision very differently.

¹ As an illustration and reminder I report here a hitherto unpublished experiment showing that the use of even a crude objective scale (the Thorndike Handwriting scale of 1910) reduces the variability of measurements of the quality of handwriting in a group of teachers by 43 per cent. and their average deviation from the true values by 50 per cent.

By studying the weights attached to various facts by the jury of experts and using various systems of these weights to obtain alternative candidates for the perfect measure of the ability we may sometimes obtain the fortunate result that the score by any reasonable system of weights will correlate perfectly, or nearly so, with the score by any other. Something like this will happen, I prophesy, in the case of ability with ideas (especially of qualities and relations) and symbols for ideas. We may sometimes find evidence that by splitting the ability into two or more we can obtain much more adequate "perfect measures" than those possible for it is as a total.¹ I conjecture that this will be true, for example, in the case of athletic ability.

We may sometimes find evidence that language and custom have misled us into trying to measure something of whose nature and symptoms even the experts are so ignorant that a close approximation to adequacy in a 'perfect measure' to be used as a criterion is as yet unattainable. I fear that such is as yet the case with, for example, 'imagination,' 'business ability,' or 'leadership.'

Replacing the ambitious task of devising tests that measure all of ability A, by the modest one of making existing tests of A, measure more of it than they now do, we can hope for sure, though not easy, progress by ingenious effort. For example, graded series of recorded spoken phrases in a foreign language to be presented by a loud speaker would make tests of proficiency in that language more adequate.

III.—PURITY AND IMPURITIES.

The best known instances of impurities in measurements are the influence of comprehension of the instructions upon the scores in tests and the contamination of measurements of knowledge and power in the essay type of examinations by ability to express oneself fluently and well. Another common case of impurity is found in tests and questionnaires intended to measure aesthetic ability by reported likes and dislikes, approvals and disapprovals. In these reports the person's actual attitudes are often contaminated by his opinions about them and himself and by his desire to score well in the test.

In tests of some pseudo-abilities, such as common sense, sanity, or freedom from neuroticism, the danger is increased, and great ingenuity must be spent in disguising the tests. Sometimes the prevention or cure of impurity involves great risk of inadequacy. This is so in certain subtle mixings of intelligence with abilities, one example of which I will describe.

The most widely used and most highly esteemed part of tests of the ability to read a foreign language is a passage of connected discourse which the persons tested translate or answer questions about. It has very great merits, but in a certain sense it does not measure a pure ability. The score obtained in a translation or any other test of the comprehension of a connected passage in a foreign language is determined not only by the knowledges and skills acquired by the person in his learning of that language, but also by his general intelligence or such features of it as are measured by such a test as CAVD or a test planned to measure Spearman's G. In particular, this second ability enables him to infer the general drift of the passage and the meanings of unfamiliar or doubtful words and phrases from the parts that he really knows.

If the ability in French that we are concerned with is that in which Frenchmen in general most exceed Americans in general, the translation or comprehension score may be greatly contaminated. French boys of age ten have far

¹ Some gain in adequacy can always, or nearly always, be had by narrowing an ability. The gain needs to be great to outweigh the obvious disadvantages of having to weight and combine a number of scores to get what is sought.

more of this ability than American college students who have "taken French" for two years, but would not comprehend certain literary, scientific or philosophical passages so well.

For some purposes this "contamination" is probably an improvement. A business firm hiring clerks to translate letters probably does well to sacrifice the 'pure' ability in the language itself to get more intelligence. So does the foreign service of a department of state or commerce. So may a school or college in its requirements in foreign languages for admission or graduation. But for one important purpose it is much better to have the measure of ability in the language unmixed with intelligence, namely, for measurements of changes in persons and consequently of the effects of ways and means of education as evidenced by changes in students.

To measure ability to get the meaning of written French, German, etc., uncontaminated by general ability to manage ideas and symbols, we will replace the long passages of connected discourses by suitable sets of phrases and short sentences. Future work should provide a large stock of phrases (including idioms), and short sentences, well graded for difficulty, frequency of occurrence, or both, from which examiners may select. The scoring may be made as objective as desired by the provision of keys.

How great is the danger of losing some essential component of ability in a foreign language by such a change? For example, suppose that the time spent on long passages in examinations were spent on well-chosen phrases and short sentences, what would we lose besides the undue influence of 'intelligence' that we wish to lose. Not much, I think. We would fail to measure æsthetic or semi-æsthetic appreciations that can only be tested by large units of prose or poetry. These appreciations are remote from the ability measured by customary translations, and above it in level. Defenders of the use of passages of connected discourse in examinations would rest their claims rather on the genuineness of the task and the insurance against such pedantries as are likely to afflict isolated sentences made up by an examiner.

Certain relatively harmless cases of impurity may serve to illustrate an important general principle. Such are the 'contamination' of ability in the biological sciences by ability to dissect and ability to draw, and the contamination of ability in physics and chemistry by the ability to manipulate apparatus. It may be argued that tests in these subjects which did *not* include these abilities at all suffered from inadequacy. We may accept this for a correct weighting of dissecting, drawing, or manipulating apparatus. Then greater weighting than that makes the test impure, and less weighting than that makes it inadequate.

The early investigations of Hotelling and Thurstone into what is now known as factorial analysis were motivated in large measure by the search for purity. The actual measurements of observable abilities were to be analysed by the aid of a table of all their intercorrelations into a number of component abilities or factors each known to be free from contamination by any of the others because it would correlate zero with each of them. Then tests were to be selected or devised which would correlate as perfectly as possible with these pure abilities. In spite of the devoted attention of Thurstone and other able workers, factorial analysis has not so far increased our equipment of adequate tests of pure abilities much if at all. Many pure factors have been discovered, at least to the satisfaction of the discoverers; but tests whereby anybody can measure them directly have not been devised. And Thurstone himself has relaxed the search for pure, though hypothetical, factors by admitting impure ones if they seem sufficiently important.

Such perfect purity as would cause all correlations with other abilities to be zero is far beyond the purity I have set up as a requirement. The latter does not require that abilities show no complexity, overlapping, or common elements, but only that the measurement as made does not extend beyond the ability as described; and especially that it does not extend beyond it in ways that are likely to mislead. Measurements of perfectly pure abilities, as capable of separate identification and measurement as the chemical elements or temperature, would be extremely valuable to science. I do not require them of the future partly because I do not believe that the mind is composed of such, and partly because in any case there are more urgent needs.

There are important realities referred to by the terms ability to see, ability to hear, ability to remember, ability in French, in German, in physics, in chemistry, musical ability, ability with ideas and symbols, ability with things and mechanisms, manual dexterity, athletic ability, etc., etc. These realities are not unitary faculties or essences but probabilities concerning behaviour; measurements of them are essentially inventories or substitutes for inventories. Starting with as adequate an inventory as expert knowledge can set forth, we seek to devise a criterion test that will correlate .95 or higher with the best weighted score from the total inventory. We then seek to devise working tests that will correlate .95 or higher with the criterion test.

IV—PRACTICAL PROBLEMS OF IMPROVEMENT.

The problem of getting definite descriptions in the form of criterion tests is largely financial. We know how to learn whether they are attainable and to get them when they are. We can make as rapid progress in this as the world will pay for. The problem of determining the merits of any working tests devised to measure an ability for which we have got the criterion is also largely financial.

In devising and improving the working tests money cannot fill the place of genius. If anybody ever invents a test of general motor ability comparable in accuracy and convenience to the measurement of the volume of a solid by the amount of liquid it displaces he will do it more by his genius than by the funds at his disposal. Even in devising tests, however, much progress can be made in the future by methods already available, if we have funds to apply these methods. Most educational abilities and many psychological abilities are best defined by a list of achievements or products produced in certain situations. A sound method of devising working tests of such abilities is simply to select items from the criterion test. The constructor of the working tests may use his genius to reduce his labour in the analysis of items or groups of items, in computing multiple correlations, etc. But he need not try, in a test of ability in Latin, French, or chemistry, to devise items outside of Latin, French, or chemistry.

In the case of many abilities, it will be desirable to arrange the items in the criterion tests in levels according to their 'difficulty.' 'Difficulty' can be determined roughly by the smallness of the percentage of successes in the population measured by the criterion test. And for our purposes this easy determination is nearly as useful as a determination by a jury of experts.¹

¹ The 'difficulty' of a task for ability in Latin, French, chemistry, etc., does not mean to expert examiners in these fields simply rarity of success among learners of Latin, French, chemistry, etc. They would consider the task of translating correctly *regni potius est* more difficult than that of translating *masigia et musmo est*, regardless of how much rarer success with the latter was, because they think of difficulty as rarity of knowledge *after equal time spent in learning* rather than as rarity *per se*.

The arrangement of the criterion test and working test in levels makes it easy to obtain separate measures (A) of how hard tasks the ability can master and (B) of how many tasks of any given degree of ability it succeeds with, as well as to obtain some over-all score in which the widths of the ability at many or all levels have weight. Measure A is of great importance for most abilities.¹

I suggest that in the future we pay some attention to an order of importance in the work of the world among items that are at the same level of difficulty and are equally valuable in measuring the ability. For example, tests of so-called general intelligence may contain tasks in completing sentences, completing drawings, putting together disarranged sentences, understanding sentences, solving arithmetical problems of many different sorts, selecting the right meanings for words, giving the synonyms for words, giving opposites of words, supplying fourth terms to fit certain relations—all of equal difficulty. Among these we regard understanding a sentence as more important for the world's work than an equally difficult putting together of a disarranged sentence, and we regard genuine problems as more important than fantastic ones. In tests of ability in Latin we would rate knowledge of words that helped in learning English, French, Spanish, or Italian as more important, other things being equal, than knowledge of words that did not. Suppose a standing broad jump of a ft., a running broad jump of b ft., a standing high jump of c inches, a running high jump of d inches, a hop, skip, and jump of e ft., a run of 100 yards in f seconds, a run of 440 yards in g seconds, a run of a mile in h seconds, a coursing of 10 miles on a bicycle in i minutes, a pole vault of j feet, a 16-lb. shot put of k ft., a throw of a baseball of l feet, and a squeeze of a hand dynamometer of m kilograms to be all at the same level. The pole vault and shot put are, presumably, somewhat less important than the running broad jump or quarter mile run.

The reduced adequacy of a test caused by omitting some of its less important items might be counterbalanced by its greater practical value as a stimulus to, and index of, wise instruction.

It is not an essential duty of psychologists to consider the relative 'practical' importance of different items in an ability, but the facts should be of considerable help to educators, economists, or others who do need such facts.

I will conclude these comments by a brief consideration of the fact that some so-called personality-traits may be measured in much the same fashion as abilities should be. That is, the 'trait' (for example, excitability, energy, kindness, honesty with property, anxiety, or sociability) may be considered as varying in amount from much to little, and as represented by an inventory of 'successes' and 'failures' in response to certain situations, graded in levels by the percentages of 'successes' in a given population. Such measurements may need to be specialized, since what excites a person may be more significant of his personality than his total excitability as per the criterion test; and what he is anxious about more significant than his total anxiety. Certain students of personality will prefer to work with purely qualitative descriptions and features, and we should welcome any sound work that they do. But they should welcome any inquiry into whether a certain quality varies in amount among persons, or only by presence or absence. If it does vary notably in amount, the measurement of its quantitative variations is likely to provide useful knowledge about its nature.

¹ Width in a persons' ability can be substituted for by using the abilities of two or more persons, but a high level of ability is not thus replaceable. A thousand persons with I.Q.'s of 50 could not do the work of a competent physician or lawyer. The work done for the world by Einstein could not have been done by a team of all the high-school teachers of physics in Berlin. No chorus could replace a Caruso.

THE NEWSPAPER READING OF ADOLESCENTS AND ADULTS.

BY W. D. WALL

(Department of Education, University of Birmingham.)

PART I.

I.—Introductory. II.—The samples. III.—Social background. IV.—How many and what kinds of newspapers are read? V.—Distribution of interest over various features of the daily paper. VI.—Attitude to the war news.

PART II.

VII.—Other features: (a) Gossip and domestic news; (b) Leading articles; (c) Political feature articles; (d) Feature articles of general interest; (e) Comic strip; (f) Cartoons; (g) Advertisements; (h) Pictures; (i) Sports news; (j) Readers' letters; (k) Military correspondent; (l) Humorous paragraph; (m) Miscellaneous; VIII.—Discussion. IX.—Summary of results.

PART I.

I.—INTRODUCTORY.

Few comprehensive surveys of the newspaper reading of adolescent and adult groups have been made. None is listed by Mrs. Blackwell¹ as having been presented as a thesis for a higher degree in a British University. Jenkinson² gives some figures for young adolescents (12+—15+) and a number of analyses have been made for commercial purposes of the age, sex, social and economic distribution of the adult readers of various daily and weekly papers.³

Thus, although the circulation of the various journals and the numbers of those who read them can be fairly accurately estimated, we know little indeed about which features of the press are widely read and less about the attitudes which they inspire. The stimulus value of the daily paper, like that of the other two major organs of popular culture, the radio and the cinema, is so complex that it is difficult to formulate adequate hypotheses for enquiry without some preliminary sampling of the field. The present investigation is in the nature of a reconnaissance with the limited objective of covering a wide area descriptively in a way which, it is hoped, will give rise to questions suitable for more exact study.

The groups about which information was principally sought were those most representative of the bulk of our population, those who did not attend grammar schools. Previous study had suggested that among a proportion at least of these, standards of literacy would not be high⁴; hence a simple form of questionnaire was used.⁵

¹ "List of Researches in Educational Psychology presented as Degree Theses in British Universities since 1918," this *Journal*, Vols. XIII, XIV and XV.

² *What do Boys and Girls Read?* Chapters VI, VII, XX, and XXI (Methuen, 1941).

³ Notably by Kimble (*Newspaper Reading in the Third Year of the War*, Allen and Unwin, 1942) and by Hobson, Henry and Abrahams (*The Hulton Readership Survey*, 1947, privately printed.)

⁴ Vide the present writer's paper: "The Decay of Educational Attainments among Adolescents after leaving School," this *Journal*, Vol. XIV, Pt. 1.

⁵ A part only of the questionnaire is dealt with in this paper. Other questions concerned the reading of periodicals and books. A paper on the "Reading Interests of Adolescent Boys" was read before the Annual General Meeting of the British Psychological Society in 1945.

A trial questionnaire was given to sample groups of adults and adolescents, the results of which will be found summarised in the writer's paper cited above. A number of modifications were made and the final draft benefitted greatly from suggestions made by Professor C. W. Valentine and by teacher colleagues of the writer. The questionnaire and the instructions for answering it are too long to print in full but details of the relevant questions are embodied in the text of what follows. The instructions emphasised the need for frankness and the anonymity of the replies. It was also suggested that those who did not wish to answer should hand in a blank sheet.

From one of the major sources of error in enquiries of this sort, that of accidental partiality in the sampling, the present data is free. Of the 1,438 questionnaires issued for use, 1,324 (92 per cent.) were returned completed, the balance of 8 per cent. being accounted for almost entirely by circumstances which did not affect the sampling.¹ For the rest, it was hoped that careful briefing of those who administered the sheets, the instructions printed at the head of each questionnaire, the simple form of the questions, and the great stress on the anonymity of the replies would reduce inaccuracy to a minimum.

II.—THE SAMPLES.

The survey was made in the autumn of 1944 and the early months of 1945. It has thus both the advantages and disadvantages of war-time conditions. These made coherent sampling of school groups more difficult than in peacetime, but rendered possible the administration of the questionnaire to relatively complete samples of adults in the services under conditions which could be kept under the direct control of the investigator.

The sample falls into three major sub-divisions :

(i) *Adolescents of technical or elementary school background*² (N=670). These were drawn from an elementary school in the North-East, juvenile employees of Messrs. Lewis's, army cadet and youth club groups, a squad of army boys, juvenile civilian employees of a military installation and from among the full-time day students of two commercial and technical schools. Adolescents from the technical and commercial courses constituted 21 per cent. of this sub-sample ; the remainder were chosen to be as representative as possible of adolescents attending elementary schools or in employment up to the age of 17·11.

(ii) *Adults of technical and elementary school background* (N=255). Other than the groups of 17+ young men and women accounted for in (i), all the adults, ranging in age from 18·0 to 30+ were members of successive squads of army men and A.T.S. entering a training wing for courses of elementary instruction. Their educational background was mainly that of the public elementary school, though a porportion had attended junior commercial or technical schools and some had been to evening classes. Their average mental level corresponded to that of elementary school-leavers, though the very dull had been eliminated by the selection procedures of the Army Directorate for the Selection of Personnel.

¹ Of the 1,324 returned completed, thirty-nine were discarded (twenty-three were completed by children just below the age range studied, and sixteen by adults who had attended grammar schools.) Twelve of the 114 blanks were randomly distributed among those of the non-grammar school samples under the age of fifteen, and probably represent children whose reading ability was so poor that they could make no showing at all. The remaining 102 represent the balance of 160 questionnaire forms issued to four army cadet groups. Of these only fifty-eight were returned, most of them from one company. It seems that in the three other companies the sheets were given out at one parade to be completed at home and returned at the next, and many were forgotten. In all but these cases the circumstances were such that the forms were completed under supervision at the time of giving out and were collected by a responsible adult.

² The nomenclature in general use at the time of the survey is retained ; but this population is, of course, representative of the ability range for which the Secondary Modern Schools will cater and of all but the best of those who will find their way to Secondary Technical Schools.

(iii) *The grammar school sample* ($N=359$). Part of the aim of the research was to bring out broad differences in reading habits which might be attributed to superior ability and to the greater stimulus provided by a good grammar school. Accordingly, the questionnaire was administered to samples of boys and girls in a large grammar school in an industrial area. Entry to the school is determined for all by tests of English, arithmetic and intelligence and competition is so keen that its population represents the best 10 per cent. and probably less of the ability range. The school is well provided with library and reading room facilities and the library services of the borough are excellent.¹

III.—THE SOCIAL BACKGROUND OF THE GROUPS.

The social and economic background of all the adolescents included in the survey, in spite of some geographical differences, is closely similar. All came from industrial, urban, areas which, before the war had had experience of widespread unemployment and which were, at the time of the experiment, relatively prosperous. Their parents, as far as could be judged, represented a fair cross section of the employed adult population, though probably a rather smaller proportion than was general were on military service. The adult sample was more mixed in origin; there is, however, no reason to suppose that it was in any way substantially different from that of the adolescent groups.

The non-grammar school groups are, of course, much less homogeneous than the grammar school ones, but the conditions of sampling were such that slight local peculiarities of opportunity or social pressure would tend to cancel out. They may be considered a fairly representative selection of those who attend elementary and junior technical school in the provinces. The grammar school group was deliberately chosen to be a favourable sample of boys and girls of their circumstances.

The detailed composition of the sample, according to age, sex and education is shewn in columns 1-4 of Table 1 A.²

¹ The questionnaire was administered to the service groups either by the writer personally or by instructors under his immediate supervision. Much of the data from the adolescent groups was collected by the writer himself. In the other cases, the questionnaire was administered under the direction of a teacher or other adult fully informed of the nature of the investigation and of the precautions required by the technique.

Thanks are due to the following for their unstinted co-operation: Dr. W. Chapman, Mr. C. J. G. Graham and Messrs. Lewis's, Mr. J. G. C. Huntley, and the staff of his school, Mr. S. E. Redman, Mr. G. Taylor and his colleagues in the boys' and girls' departments of the grammar school and to the instructors of the training wing with which the writer was serving at the time.

² The original purpose was to have at least fifty in each sub-group up to the age of 20+ (i.e., 20.0—29.11). Sufficient men over the age of thirty answered the questionnaire to constitute another group, though women of a corresponding age, because of the differential call-up, were too scantily represented to furnish a parallel sub-sample. It was not considered advisable to attempt to fill out the samples where they fell short of fifty since to do so would have meant seeking subjects over a wider geographical area and at a different time of the year and stage of the war.

The inclusion of the 17+ groups of young men and women in the adult sub-division requires some defence. The main purpose of the enquiry was to learn more about adolescents of school age and in particular of those boys and girls who will now have to stay on until fifteen and later possibly until sixteen, in secondary modern schools. 16+ is the usual school-leaving age for grammar school children; and older groups of this particular background, free of uncontrolled bias of selection, are difficult to obtain. Hence considerations of symmetry have been allowed to prevail over more purely psychological considerations, though the arbitrary nature of the division is more apparent than real.

IV.—HOW MANY AND WHAT KIND OF NEWSPAPERS ARE READ?¹

Before discussing the information on preferences for the various features of the daily paper provided by Questions 2, 3 and 4 of the questionnaire, it is necessary to know what newspapers are read and how many of them, by the groups of the survey. Accordingly, Question 1 was framed as follows:

"Which *daily* newspaper or newspapers do you read? Write their names down here . . ."

In spite of the stress on daily papers a proportion in all groups included weeklies.² In compiling the figures for Tables I, A and B, mention of these were

¹The surveys of Hobson, Henry and Abrahams and of Kimble draw attention to the fact that the papers which are read differ considerably according to the sex, social status, age and geographical provenance of the samples chosen. In the case of the present groups, we have also to reckon with the peculiarities of war-time distribution, the effects, in the case of the adolescents of the family choice of newspaper, and, in the case of the service groups, of the comparatively wide choice of newspapers offered in canteens and by the circumstances of communal life.

The questionnaire contained two questions (not dealt with above) which aimed to elicit information about the reasons prompting the choice of a daily and about whether the same papers would continue to be read after the war. Reasons of vague approval and mere custom formed the bulk of replies from all groups, though between 15 and 27 per cent. of the reasons given in all groups named some special feature of the chosen daily. Only in the group of men were political reasons given in any large proportion (25 per cent.). Between 15 and 25 per cent. of all groups stated that they would change their daily after the war; but the change, in nearly every case, is for another paper of the same type as the one now read or, in the case of service groups, for the daily, local to their peacetime home.

The figures of Tables I A and B have been examined, group by group, for significant differences in the distributions of kinds of paper read and numbers read daily which might correspond to differences in age, sex, or education. Space prevents a detailed examination of the evidence but the following conclusions seem justified. *Age*: There are few significant differences with age in the numbers of papers read daily; but among boys and men of a technical and elementary school background there is a fairly steady increase with advancing age in the numbers of illustrated dailies included in their choices, at least until the middle twenties. Among girls of a similar background, the process is not so clearly defined, but a considerable increase in the proportions of illustrated dailies mentioned occurs in the 18+ group—coincident with entry into the forces. *Sex Differences* apparently make themselves most felt among non-grammar school groups and principally in the kinds of newspaper mentioned. A change in the direction of larger numbers of girls and women reading illustrated papers begins in the mid and late teens and settles into a small but significant difference between men and women up to the age of thirty at least. *Educational Differences* and their corresponding differences in innate ability seem to be more decisively linked than either of the other influences studied, both with kinds of newspaper read and with numbers seen daily. The more able grammar school groups, both of boys and girls, read more newspapers than their counterparts from technical and elementary schools and, of those they do read, fewer are of the illustrated and slightly more of the superior type. The significant differences on which the above is based will be found tabulated in footnote ¹ to Table I A, p. 31.

It is of interest to note that Miller ("The Relation of Reading Characteristics to Social Indexes," *Am. Journ. Sociology*, No. 6, May, 1936, pp. 738-756) found that his economically, educationally and socially superior group (of adults) read an average of 1.58 newspapers daily as compared with an average of one in other groups. Similarly, although there is little broad difference between his adult groups in the *kinds* of newspaper read, there are many more in the superior division who read newspapers of high quality (p. 753)—a general trend confirmed by the figures of the Hulton Survey (Tables 4-9, inclusive). Waples and Tyler in their study of 107 sex and social groups of American adults (*What People Want to Read About*, University of Chicago Press, 1931) found that of the conditions affecting group reading interests generally, differences in sex had the most general effect, but that differences in education come next in importance and increase as the gaps in educational opportunity widen (pp. 124-0.)

²Of *total* mentions made, mentions of Sunday papers are 21 per cent. in the grammar boys' group, 28 per cent. in the grammar girls, 15 per cent. in the elementary and technical boys, 19 per cent. in the elementary and technical girls, 12 per cent. in the adult male, and 17 per cent. in the adult female group.

ignored throughout. The numbers are too small to present figures for individual newspapers and the mention of dailies, therefore, have been classified under four more or less self-explanatory headings. Under the heading *Illustrated* have been included mentions of papers like the *Graphic* (formerly the *Daily Sketch and Graphic*) and the *Daily Mirror*. In fact few mentions of illustrated dailies other than the *Mirror* are made. Under the heading *Local* are included those dailies (morning or evening) whose circulation is confined to a relatively small geographical area, e.g., *The North Mail*, *The Sunderland Echo*, *The Wolverhampton Express and Star*, *The Liverpool Post*, *Echo and Express*, and others of a similar nature. Under the heading *National*, are included all mentions of the *Daily Mail*, *Daily Express*, *Daily Herald* and *News Chronicle*. Scanty references to the *Daily Despatch* and *Daily Worker* are also grouped here. In the fourth division, which is difficult to label without offence to the others, are grouped all references to those newspapers which seem to demand from their readers a superior level of comprehension and a more leisurely approach, e.g., *The Manchester Guardian*, *The Times*, *The Daily Telegraph* and the few provincial dailies not local to the groups studied of a semi-national character and of high quality.¹

It is also possible from the replies given to Question 1 to estimate how many claim to read none, one, two and three or more newspapers daily. This is but a rough guide since 'reading' a newspaper probably means different things to different people; and there would, moreover, be a tendency to jot down papers occasionally read, especially evening papers. It is difficult too to be sure of the figures for those recording none. In some of the groups, one or more subjects left Question 1 blank. Such cases were only scored as non-readers when there was no answer also to Questions 2, 3 and 4, and clear cases were few except in the Service groups. This rather stringent criterion probably included a number of occasional newspaper readers in the numbers of those claiming to read one a day.

¹ References in this group, as will be seen from the tables, are scanty. Other than the three dailies mentioned above, few papers are mentioned though the odd mentions of such journals as the *Yorkshire Post* and *Birmingham Post* are included under this head.

There was some doubt as to whether the *News Chronicle* should be included in this group. Though it makes far less demand on the attention of its readers than, say, the *Manchester Guardian*, and, in format and presentation, resembles the *Express*, *Mail* and *Herald*, it seems to be marked by greater restraint, by more space devoted to well-informed articles of general topical interest and by the assumption on the part of its editorial staff, of a somewhat higher level of comprehension in its readers. The inclusion of the *News Chronicle* in the *Superior* group would diminish the *National* categories by between three and six per cent. and correspondingly increase the *Superior*.

*Continued from p. 31.

(iii) Educational Differences. (a) Numbers of papers read. MG.13+—ME.13+; MG.14+—ME.14+; MG.15+—ME.15+; FG.14+—FE.14+; FG.15+—FE.15+; All MG.13+—16+. All ME.13+—16+; All FG.13+—16+. All FE.13+—16+. (b) Kinds of paper read. MG.14+—ME.14+; MG.15+—ME.15+; MG.16+—ME.16+; FG.15+—FE.15+; All MG.13+—16+; All ME.13+—16+; All FG.13+—16+; All FE.13+—16+.

² In this and subsequent tables M. or F. represents Male or Female; G. stands for grammar school; and E. for technical and elementary.

³ No answer to this question was given by three men, two in the 17+ and one in the 18+ group who, however, answered the other questions and have been counted as reading one newspaper each.

⁴ Three men (5 per cent.) said they read any which came to hand.

TABLE I A
TYPES AND NUMBERS OF NEWSPAPERS MENTIONED BY THE VARIOUS AGE, SEX AND
EDUCATION SUB-GROUPS.¹
(1,284 SUBJECTS.)

Age Group	Sex ^a	Educ. ^a	No. in Group	Types of Newspaper Read % of Mentions.				Number of Newspapers Read Daily %Proportions of Group				Average No. Daily.
				Illus.	Local	Nat'l	Sup'r	0	1	2	3+	
13+	M.	G.	44	8	53	28	10	0	27	59	14	2.0
	F.	G.	35	10	60	28	2	0	40	48	12	1.7
	M.	E.	75	12	50	38	0	1	51	33	15	1.6
	F.	E.	41	17	62	22	0	8	42	42	8	1.5
14+	M.	G.	48	10	54	32	4	0	35	52	13	1.8
	F.	G.	36	4	66	30	0	0	28	53	19	2.0
	M.	E.	89	7	35	58	0	2	56	33	9	1.5
	F.	E.	128	14	56	30	0	5	49	35	10	1.5
15+	M.	G.	51	13	50	34	3	0	27	55	18	1.9
	F.	G.	60	8	56	34	2	0	18	51	31	1.9
	M.	E.	81	20	24	56	1	1	63	28	7	1.4
	F.	E.	64	25	48	25	2	5	41	44	11	1.6
16+	M.	G.	51	7	53	38	2	0	24	55	21	2.0
	F.	G.	34	10	46	43	0	0	41	44	15	1.7
	M.	E.	73	33	12	51	4	1	25	35	38	2.0
	F.	E.	42	16	52	31	0	2	54	28	15	1.6
17+	M.	E.	36	33	10	53	4	0 ^a	33	33	33	2.1
	F.	E.	41	22	39	37	2	2	49	39	10	1.6
18+	M.	E.	36	33	11	51	0 ^a	0	47	36	17	1.7
	F.	E.	34	40	6	51	2	9	44	41	6	1.4
20+	M.	E.	52	25	10	62	3	11	46	29	13	1.5
	F.	E.	67	44	9	41	6	2	37	51	11	1.7
30+	M.	E.	66	11	7	78	3	10	41	29	20	1.6

¹ For convenience in making rapid comparisons all figures above are given as percentages, in spite of the smallness of some of the samples. One hundred and twenty-two comparisons between the groups of this and Table I B have, however, been made by means of the χ^2 test. These comparisons have been made between groups alike in two of the three classifications—age, sex or education—and unlike in the third. In all cases the raw numbers were used for the calculations, though in the case of the consolidated groups of Table I B the adjusted raw figures were used. The following differences were found to be significant within the limit of $P < .05$, (in most cases $P < .01$):

(i) Age Differences: (a) Numbers of papers read. FG.15+—FG.13+; FG.15+—FG.16+; ME.16+—ME.13+; ME.16+—ME.14+; ME.16+—ME.15+; ME.17+—ME.20+; FE.20+—FE.17+; FE.20+—FE.18+. All FG.13+—16+—All FE.17+—20+; All MG.13+—16+. All ME.17+—20+. (b) Kinds of papers read. ME.13+—ME.14+; ME.13+—ME.15+; ME.13+—ME.16+; ME.14+—ME.15+; ME.14+—ME.16+; ME.15+—ME.16+; ME.16+—ME.17+; ME.17+—ME.18+; FE.14+—FE.15+; FE.17+—FE.18+; FE.17+—FE.20+. All FG.13+—16+; All FE.17+—20+; All MG.13+—16+. All ME.17+—20+; All ME.13+—16+. All ME.17+—20+; All FE.13+—16+. All FE.17+—20+.

(ii) Sex Differences. (a) Numbers of papers read. ME.16+—FE.16+; ME.20+—FE.20+; All ME.17+—20+. All FE.17+—20+. (b) Kinds of paper read. ME.14+—FE.14+; ME.15+—FE.15+; ME.16+—FE.16+; ME.17+—FE.17+. All ME.13+—16+. All FE.13+—16+; All ME.17+—20+. All FE.17+—20+.

Continued at foot of p. 30.

TABLE I B
TYPES AND NUMBERS OF NEWSPAPERS MENTIONED—CONSOLIDATED GROUPS,¹

Age Group	Sex.	Ed.	No.	Types of Paper Read % of Mentions.				Numbers of Papers Read Daily. % of Group.				Avg. No. read daily
				Ill.	Loc.	Nat.	Sup.	0	1	2	3+	
Adolescent 13.0—16.11	M.	G.	194	9.5	52.5	33.0	5.0	0	28.3	55.3	16.5	1.9
	F.	G.	165	8.0	57.0	34.0	1.0	0	31.8	49.0	19.5	1.8
	M.	E.	318	18.0	30.3	50.8	1.3	1.3	48.8	32.3	17.3	1.6
	F.	E.	275	18.0	54.5	27.0	0.5	5.0	47.0	37.0	11.0	1.6
Adult (17.0—29.11) (17.0—29.11) 30+	M.	E.	124	30.3	10.3	55.3	2.3	3.7	42.0	32.7	21.0	1.8
	F.	E.	142	35.3	18.0	43.0	3.7	4.7	43.3	43.3	9.0	1.6
	M.	E.	66	11.0	7.0	78.0	3.0	10.0	41.0	29.0	20.0	1.6

Table I A presents the detailed results of these analyses in each sub-group of the total sample; and Table I B the consolidated figures for the main age, educational and sex groups. From these two tables it appears that newspapers of the type of the *Telegraph*, the *Times* and the *Manchester Guardian* make little appeal, even to the groups of grammar school children. On the other hand, illustrated dailies are read by substantial proportions of most groups, especially those educated at elementary and technical schools. After the age of fourteen, too, there seems to be a tendency for the numbers preferring such papers to increase until, among the men and women under thirty, the figures greatly exceed a quarter of the mentions made.

Further light upon the extent of newspaper reading is thrown by the frequencies of those naming none, one, two and three or more papers. It seems that in the adolescent groups only very small proportions indeed do not read a newspaper and that such non-readers are confined to the elementary and technical school groups. In the grammar school groups on the other hand it seems that more than half in most cases see more than one paper daily. It is only in the adult groups, and especially among the older men, that considerable proportions of non-readers are found, though high percentages also claim to read more than one daily. The figures in these tables suggest that the habit of at least scanning the paper each day is almost universal in all groups of our population. It seems probable, too, that the custom begins before the years of adolescence. This universality of exposure to the influence of the popular press is a factor to be reckoned with though the effects of it are as yet obscure.²

¹ The sub-samples have been equalized in weight in spite of discrepant numbers. Percentages have been rounded to one place of decimals and hence do not always total exactly 100 per cent.

² Interesting comparative figures substantially the same in tenour, will be found in Kimble (*op. cit.* p. 21), Hobson, Henry and Abrahams (*op. cit.* Tables 2, 3 and 11) and Jenkinson (*op. cit.* pp. 87-8, 232-3). It seems probable that the proportions of non-readers in the tables above underestimate the numbers in the total population. Those whose level of literacy was too low to read a newspaper adequately would probably not have been fairly represented in the author's groups or would have handed in blank papers. Kimble's survey carried out in 1941 suggests that 22.5 per cent. of men (25.5 per cent. of service men and 17.6 per cent. of civilians) and 34.7 per cent. of women (34.4 per cent. of service women and 34.7 per cent. of civilian women) read no daily paper. The Hulton Survey (1947) gives figures of 11.1 per cent. of men and 17.0 per cent. of women in the middle and lower income groups as reading no daily paper. Gray and Munroe (*The Reading Interests of Adults*, New York, 1936, pp. 31-5), citing unpublished American studies carried out in

V.—DISTRIBUTION OF INTEREST OVER THE VARIOUS FEATURES OF THE DAILY PAPER.

The remaining three questions are closely interrelated. Question 2 sought to obtain information as to which features of the daily newspaper read had the most appeal at various ages. Question 3 aimed to gather pointers to the reasons why certain features were read, and Question 4 tried explicitly to find what the prevailing attitude was towards the news of the war which filled much of the news space at the time of the survey.

In Question 2, the subjects were asked to place the various parts of the daily paper listed in Table II¹, in an order representing the degree of interest they took in these. The list was carefully compiled from an examination of all the popular national dailies and most of the local dailies (morning and evening) published in the areas from which the samples came. The build up of most of the dailies, local and national, was found to be closely similar, but, of course, the quality and attractiveness of similar features as well as the space allotted to them by different editors, differed considerably. The principal difficulty was found to be in making a list which was brief enough to be held in mind by the least intelligent subjects, full enough to omit nothing of importance, clear enough in definition not to be misunderstood, and yet sufficiently general to apply to all the newspapers most likely to be read by the groups.² The result is inevitably a compromise and not an entirely satisfactory one. That it was sufficiently comprehensive is indicated by the comparative scantiness of the replies to the last item, which asked the subjects to put in any feature not previously covered; but clues provided by the answers to Question 3 showed that one of the items—'pictures'³—had been misunderstood in a number of cases.

the 1920's, suggest that the overall figure for the whole population (*American*) is between 3 and 4 per cent., but give figures ranging between 16 per cent. and 7 per cent. for adults employed in Public and Personal Service, Trades and Labour and for those who had the briefest schooling. In view of the figures for illiteracy among American Army recruits in World War I and the proportions of illiterate and semi-literate men and women in our peacetime population as estimated by Burt ("The Education of the Illiterate Adult," this *Journal*, Vol. XV, Part I, 1945, p. 27) one would expect the numbers of those who do not read a daily newspaper, or at the best scan the pictures, to be approaching 20 per cent. It is possible that Kimble's figures are higher because at the time of his survey there was considerable interference with distribution (by air attack) and the conditions in military camps in this country were, on the whole, not as good as they were later in the war. The figures of the Hulton Survey seem too low. Probably a research conducted orally would include as "readers" some at least of those who could, in fact, do little more than decipher inaccurately some of the headlines and glance at the pictures.

¹ The question was framed as follows: "Below are the main parts of a newspaper. First of all go through the list and cross out those parts which you *never* read. Then, in the brackets in front of those which are left, put (1) opposite the part in which you take most interest; (2) opposite the next most interesting; and so on." Then followed the list as given in Table II with the addition of: "Anything not listed above. Write down what it is here . . ."

² It is in fields such as this that the results of a questionnaire approach are most equivocal since the information asked for is in some degree subjective and since we have as yet no adequate means of knowing how the interest shown by one individual differs in emotional intensity from that displayed by another. Moreover, there are variables in the field of study itself—differences between newspapers for example or between the interpretations placed by individuals upon descriptive terms—which are to varying degrees incalculable. Such considerations, which have most weight in interpreting the answers to Question 2, suggest that an approach like the present can only be tentative and suggestive; but it is doubtful whether at the present stage much more exact methods of dealing with groups are available.

³ Some of the apparently duller members of the elementary and technical adolescent and adult groups, and a few grammar school boys and girls, evidently took this to mean Cinema programmes or even film criticism—a shrewd comment on the pervasiveness of the Cinema in their thinking.

More difficult to assess accurately is the reliability of the answers given and to express these as an index for the groups concerned. Though sounder statistically it would have been difficult to restrict the list to those parts of the newspaper which were certainly of universal interest (had they been known), and to have asked for an order in which all items given were ranked. Such a course would have permitted the calculation of a reliability coefficient for each group but would have severely limited in other ways the information obtained. Instead, all subjects were asked to delete those items which they never read and to number the remainder in rank order of interest. This produced a result difficult to handle with refinement, but more suitable (in that it allowed the subject the greatest possible freedom), to an exploratory survey like the present.

In analysing and tabulating the results, the proportions of each group deleting each item were recorded. This forms a kind of inverse index of interest for the group since the instruction to cross out those sections which were *never* read was explicit. The remaining items were then allotted a mark, 14¹ for first place, 13 for second, 12 for third and so on. The score for each item was then summed and expressed as a percentage of the possible score had every subject ranked it first. This figure provides a rough index of the degree of interest in the particular item shewn by the group.²

The order in which many of the items were ranked varied and members of the same group placed them at the extremes of their lists. Hence the 'interest indices' for the various groups though they indicate central trends, mask a considerable range of individual differences.

In some cases the question was imperfectly answered and while most items were deleted or ranked according to the instructions given, some were left blank. In such cases the items left blank were allotted a position as if they had been equal to each other in interest but below those put in order. On the whole, the question was conscientiously answered and the number of such imperfect answers is not great. Table II presents the results of this analysis as consolidated figures for the major age, educational and sex sub-divisions of the sample. In Columns (a) are shown the percentages of the groups who deleted the item because they never read it and in column (b) the percentage interest score derived as described above. The figures in brackets indicate

¹ Fourteen and not thirteen was allotted for first place since a small proportion of most groups added a further item in the space provided and some placed it in order of interest.

² This method of obtaining a group index is open to objections both logical and statistical, especially if we seek to apply the indices so obtained to individuals; none-the-less, it does indicate central tendencies within each group and seems to be as accurate as the nature of the data itself warrants. An indication of its reliability may be gathered by correlating the rank order of the items for each group on this percentage index with that given by the proportions deleting each item. The average of the twenty-three coefficients so obtained is .89; thirteen of the coefficients are of the value of .9 or better, seven of .8 or better, and only three fall below that (.66 girls grammar 13+; .68 girls grammar 16+; and .73 women 18+).

In the correlation of indices, there is, of course, a certain (and in this case incalculable) element of the spurious, since averages tend to ignore the variation within the populations from which they are drawn. Moreover, the deletion of an item by a subject means that it does not score and, therefore, does not contribute to the composite interest index. A certain and probably fairly high degree of correlation between the two orders would be expected to follow automatically from these two circumstances alone and the coefficients cited above cannot be considered directly comparable with coefficients derived by the split-half method or by correlating two successive administrations of the same test. None the less the high values obtained suggest that the use of the composite interest index is a legitimate refinement upon the mere ticking or deletion of items which is a method frequently employed in data of this sort. There seems to be no reason to suppose that it is less reliable or more open to objection than the somewhat more complicated method (for the subject) of asking him to rate each item on a three or five point scale.

TABLE 11
THE DEGREE OF INTEREST SHOWN IN VARIOUS SECTIONS OF THE NEWSPAPER.
CONSOLIDATED GROUPS.¹

	Boys: Grammar 13.0—16.11		Girls: Grammar 13.0—16.11		Boys: Technical and Elementary 13.0—16.11		Girls: Technical and Elementary 13.0—16.11		Men: Technical and Elementary 17.0—29.11		Women: Technical and Elementary 17.0—29.11		Men: Technical and Elementary 30+	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b
Current News of the War	7 (3)	80 (1)	16 (8)	71 (2)	15 (4)	79 (1)	35 (6)	55 (5)	8 (1)	83 (1)	11 (2)	79 (1)	2 (1)	84 (1)
Gossip and Domestic News...	81 (13)	8 (13)	27 (10)	49 (8)	89 (13)	7 (13)	50 (8)	35 (9)	62 (13)	21 (13)	27 (8)	50 (8)	64 (13)	21 (13)
Leading Article...	37 (10)	41 (10)	32 (12)	44 (11)	49 (9)	35 (9)	69 (12)	19 (12)	26 (9)	46 (10)	32 (9)	42 (9)	11 (3)	68 (3)
Political Feature Article	54 (12)	28 (12)	67 (13)	20 (13)	72 (12)	18 (12)	83 (13)	8 (13)	42 (11)	34 (11)	59 (13)	25 (13)	17 (7)	62 (4)
Feature Articles of General Interest	2 (7)	56 (8)	11 (6)	69 (4)	40 (8)	42 (8)	55 (9)	29 (10)	16 (6)	57 (4)	21 (7)	53 (7)	9 (2)	58 (5)
Comic Strip	16 (6)	56 (7)	6 (5)	60 (7)	12 (2)	67 (3)	13 (3)	71 (1)	20 (7)	51 (7)	13 (5)	56 (5)	38 (10)	32 (11)
Cartoon	6 (2)	64 (3)	1 (1)	69 (5)	11 (1)	67 (2)	13 (2)	67 (3)	10 (5)	55 (5)	11 (3)	56 (4)	18 (8)	46 (8)
Advertisements...	39 (11)	30 (11)	13 (7)	39 (12)	50 (10)	30 (11)	23 (4)	56 (4)	45 (12)	27 (12)	35 (10)	34 (11)	44 (12)	29 (12)
Pictures	8 (4)	60 (6)	4 (2)	69 (3)	14 (3)	59 (5)	8 (1)	70 (2)	9 (2)	58 (3)	7 (1)	61 (3)	14 (6)	56 (7)
Sports News	20 (8)	66 (2)	26 (9)	46 (9)	29 (6)	59 (4)	57 (10)	41 (8)	10 (3)	71 (2)	55 (12)	26 (12)	12 (5)	70 (2)
Readers' Letters	12 (5)	62 (5)	5 (4)	78 (1)	51 (11)	34 (10)	39 (7)	44 (7)	21 (8)	50 (9)	15 (6)	63 (2)	11 (3)	58 (6)
Military Correspondent ..	24 (9)	45 (9)	31 (11)	44 (10)	37 (7)	44 (7)	67 (11)	20 (11)	28 (10)	50 (8)	40 (11)	35 (10)	42 (11)	37 (10)
Humorous Paragraph	6 (1)	63 (4)	4 (3)	68 (6)	27 (5)	46 (6)	31 (5)	44 (6)	10 (3)	54 (6)	11 (3)	54 (6)	21 (9)	42 (9)

¹ In calculating the figures of this table the relevant figures and indices for the several sub-groups of the sample have been weighted proportionately to sample sizes, thus equalising their contributions to the final composite percentages. All percentages are given to the nearest whole number.

² Under each group are shown in column (a) the percentage of the group who claim that they *never* read the item in question, and the order of interest is based on column (a); in column (b) the composite interest score expressed as a percentage and derived as described in the text, and the rank order of the items based on this.

the rank orders of preference for the various items in each group. Detailed illustrations of the fluctuations in favour of individual items within each year group are given graphically later in this paper.

In spite of the limitations of the material and the method, a number of broad generalizations are suggested by this table. If we glance at the columns showing the percentages of the sub-groups who never read various sections of the paper (cols. (a)), it seems clear that more adolescents of a grammar school background, especially girls, take some degree of interest in most of the items listed than do their contemporaries from technical and elementary schools. In this they resemble the adult groups. If we look at it another way, and consider the percentage interest scores (shown in cols. (b) for each group) we find that there are few items indeed for which the interest score of the technical and elementary groups between 13+ and 16+ is on the average higher than for their grammar school contemporaries. The exceptions to this are significant. The *Comic Strip* is more popular among technical and elementary school adolescent groups than among grammar school boys and girls; so too, slightly, are *Advertisements*.

In most groups, on the average, *Current News of the War*, stands highest both in the numbers of those reading it and in interest score. In the two groups of adolescent girls, however, it occupies a lower position, coming second in interest to *Readers' Letters* in the case of grammar girls, and fifth after *Comic Strip*, *Pictures*, *Cartoon* and *Advertisements* in the case of girls from technical and elementary schools. In the case of grammar school boys, and men, news of *Sport* comes next after the war news and in the case of boys from elementary and technical schools, the *Cartoon* and *Comic Strip* occupy second and third place in their interest. *Readers' Letters*, *Pictures* and the *Cartoon* are the second, third and fourth in favour with the women. *Humorous Paragraph* is half-way up all lists except that of men over thirty. Only among the senior group of men do *Leading* and *Political Feature* articles appear to hold any marked interest. On the general evidence of Table II it seems fair to state that much of the interest shown in the daily press, especially by adolescents, is not of a serious cast.¹

We may now turn to a consideration of the individual items of Question 2 and try to arrive at a picture of the way in which interest in them fluctuates from age to age according to sex and education. For this purpose, the composite interest scores seem to be useful since these reflect not merely the proportions of the various groups reading the feature in question, but the order in which

¹ Very little comparative information from other sources is available. In their previously cited book (pp. 71ff. and p. 43) Gray and Munroe summarize researches by Hotchkiss and Franken, and by Ross which indicate that in various adult groups, *News*, *Editorials*, *Politics*, *Sports*, *Special Articles* and *Cartoons* are read in that order of interest by business and professional men, male college students and clerical workers. Their own study of groups in Chicago suggests that the *Comic Section* ranks highest for men and women, followed by the *News*. Third in the favour of the men comes *Sport* followed by *Editorials*. Third for women comes the *Home Page* followed by *Advertisements* and *Sport*. The order found for their groups of adults in Evanston is different. Both men and women placed *News* first; *Sport*, *Editorials* and *Comic Section* followed next in order for the men; *Home Page*, *Comic Section* and *Editorials* for the women. (*op. cit.* pp. 150ff.)

Rasche (cited by Gray and Munroe, *op. cit.* p. 114) found *Comics*, *Stories*, *News*, *Sports* and *Pictures* most popular in his young adolescent Chicago children and Nelson (Gray and Munroe, *op. cit.*, p. 114) found among high school pupils, a similar order: *Sport*, *Funny Strips*, *News*, *Scandal*, *Advertisements*, *Columns*, and *Cartoons*; no *Editorials* were checked.

In Jenkinson's groups (*op. cit.*, pp. 92-3, 234-5) the *News* is read by three quarters or more of boys and girls of all age and education groups. The *Sport* is read by more than three-quarters of the boys and except at 15+ by rather less than half of the grammar school girls, and by less than 30 per cent. of girls from senior schools.

it was ranked compared with other items in the list. The diagrams which follow, therefore, are based on the interest scores returned by the twenty-three sub-groups of the sample. On this merely numerical description, the data provided by Question 3, in which the subjects were invited to state the reasons for their first and second preferences in Question 2,¹ throws a valuable qualitative light.

TABLE IIIA.

PROPORTIONS OF THE VARYING AGE, SEX AND EDUCATION SUB-GROUPS PAYING VARYING DEGREES OF ATTENTION TO NEWS OF THE WAR.²

Age.	Sex.	Educ.	N.	Reading War News.		
				"Rarely read, Headlines or News," or "Headlines only." %	"Headlines and some of News." %	"Headlines and all News." %
13+	M.	G.	44	7	66	27
	F.	G.	35	17	57	26
	M.	E.	75	22	52	27
	F.	E.	41	12	71	17
14+	M.	G.	48	12	44	44
	F.	G.	36	3	88	9
	M.	E.	89	10	57	33
	F.	E.	128 ³	33	48	19
15+	M.	G.	51	2	76	22
	F.	G.	60	10	83	7
	M.	E.	81 ⁴	10	60	31
	F.	E.	64 ⁵	17	56	26
16	M.	G.	51	4	69	29
	F.	G.	34	12	76	12
	M.	E.	73 ⁶	5	54	41
	F.	E.	42 ⁷	37	15	49
17+	M.	E.	36 ⁸	6	57	37
	F.	E.	41 ⁹	16	66	18
18+	M.	E.	36	3	80	17
	F.	E.	34 ¹⁰	9	65	26
20+	M.	E.	52	4	48	48
	F.	E.	67	1	48	51
30+	M.	E.	66	5	31	63

¹ Framed as follows:

Question 4.—Write here a few lines explaining very briefly why you are interested in the first two you have chosen in Question 2.

1st Choice.

2nd Choice.

² In spite of the smallness of the samples, figures have been given as percentages for convenience of rapid comparison.

Where, as indicated in footnotes, papers have been spoiled, the percentages have been calculated on the basis of the diminished groups. For the statistically significant differences, see page 38 footnote.

³—2 papers spoiled.

⁶—2 papers spoiled.

⁹—3 papers spoiled.

⁴—9 papers spoiled.

⁷—1 paper spoiled.

¹⁰—3 papers spoiled.

⁵—2 papers spoiled.

⁸—1 paper spoiled.

VI.—ATTITUDE TO WAR NEWS.

The first item listed in Question 2 was considered of sufficient importance to justify the inclusion of a supplementary question devoted to it exclusively. Question 4 was, accordingly, worded as follows:

Question 4.—Do you usually read the war news other than the headlines? Put a line under *one* of the following answers to show what you generally do: (i) I read the headlines only; (ii) I always read the headlines and all the war news; (iii) I read the headlines and some of the war news; (iv) I rarely read either the headlines or the war news.

Before going on to deal with *current news of the war* as an item in Question 2, it will be convenient to consider the answers to this question.

In all groups, the majority claim to read at least the headlines and some of the news and the proportions "rarely reading the headlines or the news" and "reading the headlines only" are small in all but the 14+ and 16+ technical and elementary girls' groups. Accordingly, in Tables III A and B, the data from this section of the questionnaire are shown under three headings only, responses to sections (i) and (iv) of question 4 being combined.

TABLE IIIB.

PROPORTIONS OF THE CONSOLIDATED GROUPS PAYING VARYING DEGREES OF ATTENTION TO THE WAR NEWS.

Age Ranges.	Sex.	Reading War News.				
		Ed.	N.	"Rarely read Headlines or News" or "Headlines only." %	"Headlines and some News." %	"Headlines and All News." %
13+—16+	M.	G.	194	6.3	63.8	30.5
	F.	G.	165	10.5	76.0	13.5
13+—16+	M.	E.	318	11.5	55.8	32.7
	F.	E.	275	24.8	47.5	27.8
17+—20+	M.	E.	124	4.4	62.0	34.0
	F.	E.	142	8.7	59.7	31.7
30+	M.	E.	66	5.0	31.0	63.0

These two tables bring out some interesting tendencies. In the adolescent groups there are few differences with age which are statistically reliable.¹ In the

¹ The sixty-one comparisons by age, sex and education (since the frequencies in the "rarely read headlines or news" and "headlines only" sections in some cases are less than 5), have been made by calculating the value of χ^2 for a 2×2 table on the dichotomy; those who claim to read all the news; those who do not. The following differences were found to be significant at the level $P < .05$ (for most $P < .01$):

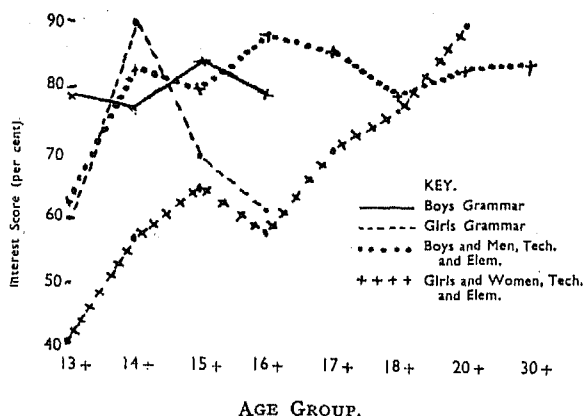
(i) Differences with age: MG.14+—MG.15+; FG.13+—FG.15+; ME.18+—ME.20+; ME.18+—ME.30+; ME.17+—ME.30+; FE.17+—FE.20+; FE.18+—FE.20+. All FE.13+—16+. All FE.17+—20+; All FG.13+—16+. All FE.17+—20+; All ME.17+—20+—ME.30+.

(ii) Differences with sex: MG.14+—FG.14+; FG.15+—FG.15+; M.E.14+—FE.14+; ME.16+—FE.16+; All MG.13+—16+—; All FG.13+—16+; All ME.13+—16+—; All FE.13+—16+; All ME.17+—20+; All FE.17+—20+.

(iii) Differences by Education: FG.15+—FE.15+.

groups of adults, however, with the exception of the men of 18+, there seems to be a steady increase in the numbers of those who claim to read all the war news. There is no consistent, marked difference which might be ascribed to difference in *education*, except that between girls of 15+ from the two different educational backgrounds. Difference in sex seems to be the most decisive influence. Within the finer groupings of Table III A the differences are not in all cases statistically reliable, though the tendency for boys to claim that they read all the news and for girls to express more indifference, is clear, especially in the technical and elementary groups. All the sex differences of Table II B, however, are fully reliable. Perhaps the most striking fact brought out by the tables, and one which gives us pause, is the comparatively large proportion of adolescent girls in these samples who professed themselves more or less indifferent to the news of the war.

DIAGRAM I.—CURRENT NEWS OF THE WAR.



Additional evidence is provided by the interest scores derived from the replies given to Question 2 by the various sub-divisions of the sample. Diagram I shows the way in which the interest in *Current News of the War* fluctuates from age to age in the different sex and educational sub-groups. It will be seen that the male groups (with the exception of the youngest technical and elementary boys) return a consistently high interest score for this item. In the group of grammar school girls, interest appears to rise from 13+ to a high level at 15+ and thereafter to fall considerably. In the case of girls and women of a technical and elementary school background, with the exception of a slight recession at 16+, there is a steady increase in interest throughout the age range studied. Thus the interest scores for this item confirm the general conclusions drawn from the discussion of Question 4.

The nature of the interest in all groups is made abundantly clear by the comments given in answer to Question 3. Most typical are remarks like "I want to know how the war is getting on," or "It is interesting to everybody and effects¹ everybody." Many, too, especially among the adolescent groups, express a sense of personal involvement; they mention a desire to know how "our boys" are getting on, or speak of relatives at the front or in prisoner-of-war

¹ In this and succeeding sections, the replies are cited *verbatim* with all their imperfections of spelling, punctuation, grammar and syntax.

camp. For example, a grammar school girl of 13+ writes: "I like to read about the war and the places where fighting is taking place as I have several relations either in the Army or Air Force." The war maps which were a feature of the papers at the time are frequently mentioned especially in the grammar school and adult groups—"I like to know how the war is going and I like geogphry and like following the maps," writes one woman of 18+ and a girl (technical and elementary group 16+) "because my favourite hobby is geog-raphy and I would like to travel." Others in all groups mention that the news helps in discussion or in following current affairs. Among the service groups, comementions of a desire for the end of the war and the consequent demobiliza-tion. This is somewhat bitterly put by a woman of 20+ who says: "... to try and judge how soon the war will come to an end, as I am just waiting to get away from this concentration camp," and a man of 30+ (whose first interest is *Sports News*) writes: "To see how my release group is affected by the war." A very few, mainly in the adult groups, speak of the suffering involved in the war "anxiously waiting for the cessation of hostilities," writes a man of 30+, "am not in favour of wars, owing to suffering and loss of life it brings to humanity, and of the destruction of notable beauty spots."

(TO BE CONCLUDED.)

ASSESSMENT OF INTEREST IN PRACTICAL TOPICS

By E. A. PEEL

(Reader in Educational Psychology in the University of Durham.)

- I.—Introduction. II.—Information tests—an extended technique to allow
choice of items. III.—Method of scoring. IV.—An experimental study.
V.—Conclusion.

I.—INTRODUCTION.

THERE are two well-known results which arise from the satisfaction of an interest. On the one hand there is the subjective feeling of pleasure which attends the satisfaction of the interest and tends to produce a tension in the person, which is released by expression of the pleasure when the topic of interest is recalled. On the other, there is the mass of information which may accrue from active satisfaction of the interest. Both these aspects have been used as means of assessing interests.¹ The former gives rise to the voting, rating and ranking methods such as are embodied in tests like the vocational interest blank compiled by E. K. Strong² and the technique used by Shakespeare³ for evaluating the popularity of school subjects. These methods depend for their validity upon the value of the person's opinion or judgment and they share the weakness of all questionnaire methods in that they may fail to provide a genuine test situation in the sense recently noted by Burt.⁴ Furthermore, they may not provide an efficient means of assessing the stability of an interest.

In the second approach to interest testing, the information that is acquired in the course of the satisfaction of an interest is made the basis of the interest measurement. Such a test is called an information test,⁵ and can be said to provide a genuine test situation in the sense of that provided by an attainment or ability test. The person's interest is assessed by the knowledge he possesses about the topic of interest. The information test may be specially useful when it is wished to test interest in a single field, such as the practical fields, nature study, and popular mechanics.

In particular in connection with the problem of allocation of children to technical or grammar schools the results of interest tests in practical or academic fields might be used to supplement the customary methods of selection on a basis of abilities and attainments. The suitability of information tests for such a purpose has been investigated recently⁶ and a test devised by Miss C. M. Lambert, County Educational Psychologist to the Northumberland Education Authority contained a randomly mixed collection of equal numbers of two kinds of items, those markedly "practical" and those more academic and literary. Children were required to answer as many of the questions as possible and their separate totals obtained in the practical and academic sections. Although the test successfully differentiated between the children on grounds of general ability and grammar-school aptitude, it failed to discriminate between the

¹ FRYER, D.: *Measurement of Interests* (New York, 1931).

² STRONG, E. K.: *Vocational Interest Blank*. (Stanford University Press, 1927).
See VERNON, P. E.: *Assessment of Psychological Qualities by Verbal Methods*, p. 91,
Rep. No. 83, M.R.C. Ind. Health Res. Bd., 1938, and FRYER, *op. cit.* p. 21.

³ SHAKESPEARE, J. J.: "An inquiry into the relative popularity of school subjects
in elementary schools, this *Journal*, Vol. VI, p. 147, 1936.

⁴ BURT, C.: "Assessment of Personality," this *Journal*, Vol. XV, Pt. III, p. 114, 1945.

⁵ FRYER, *op. cit.*, Chap. 8.

⁶ Unpublished research by the Northumberland and the Grimsby Education Authorities
in conjunction with the writer.

predominantly academically interested child and the child whose interests are mainly practical. It appeared that the more able child, irrespective of interests, could acquire more information in a wider field and so scored as highly on the practical items as the merely technically interested child.

II.—AN EXTENDED TECHNIQUE TO ALLOW CHOICE OF ITEMS.

The test already mentioned possibly failed to discriminate between the two fields of interest because it compelled the children to attempt as many items of both kinds as possible and so tended to obscure any difference of interest by the over-riding influence of general ability.

To overcome this difficulty the writer devised a technique whereby the child had to make a choice of the items he wished to answer. The test was still of the information type, but, instead of being compelled to answer as many as he could, the child was compelled to make a *choice between practical and academic items* without being aware of the test pattern. By this device it was arranged that the responses to practical and academic items were mutually exclusive, and that, this being so, a polarity would tend to be set up between the two kinds of response and that these responses would be determined on grounds of interest rather than general ability. The claim that interest and not familiarity acquired in school may be the ultimate determiner of the choice of response is based on the assumption that the items represent the kind of information, practical and non-practical, which a child of 10-11 might have acquired from sources other than his organized school work.

The technique was incorporated into two tests, the first a multiple choice information test, devised by Miss Lambert and the writer, and the second a 'meaning of words' test compiled by the writer. The 'meaning of words' test was an application of the technique used by Slater in his *Selective Vocabulary Test*¹ for masculinity—femininity, by using practical and academic words instead of masculine and feminine words. The further improvement was made by introducing the element of choice from mutually exclusive words (in Slater's tests as many items as possible are to be attempted).

In applying the technique for introducing choice, each of the tests was divided into sub-tests of six items, three of them practical and three academic, mixed together in random order. The six items in any one sub-test were of equal difficulty as determined by a previous validation on a sample of children similar to those for whom the test was intended.² In the final form of the test the children were instructed to answer only three questions from each sub-test of six items.

Here is a specimen sub-test from the multiple choice information test. In items 7, 10 and 11 the drawings have been omitted.

PART B.

REMEMBER—Look through all questions and then *attempt only three questions from each Section.*

7.—Put a X beside the tent peg which has been driven in at the best angle.

¹ SLATER, P.: *Selective Vocabulary Test* (Harraps, London, 1944), Handbook and Test.

² The determination of the degree of difficulty of each item is important and was obtained by mixing the two kinds of items at random and then applying the test making sure that the children had time to look through all the items. The items were then classified on a basis of percentage of difficulty and grouped into sub-tests of six items of equal difficulty three practical, three academic. Easier items were collected into the earlier sub-tests.

- 8.—Here is an incomplete verse of poetry. One line will complete the verse. Choose the most suitable line from the four lines of poetry given.

Incomplete verse :

The Tinker's house is wide and high,
His roof is gemmed by moon and stars,
Green boughs are his tall window bars,

Lines to choose from :

I envy nobody, no, not I.
His bed is curtained by the sky.
Over the wheat fields wide.
Three hundred feet of fall.

- 9.—Which is the most correct description of the stories written by Charles Dickens?

Underline the correct one.

Stories of exploration :
Fairy Stories :

Lives of animals :
Stories of ordinary people.

- 10.—Imagine you are to assemble an electric iron from the parts shown below. Show by using the letters, the order in which you would put the parts together.
Order.....

- 11.—Here are some drawings of different types of chisels. Put a X under the diagram of a *cold chisel*.

- 12.—Here are some names from ancient history. Underline the names of the man famous for his journey over the Alps.
Hannibal ; Archimedes ; Brutus ; Cicero ; Romulus.

In the final form of the multiple choice information test there were five such sub-tests.

As a result of a preliminary investigation held in Grimsby, it was evident that there was some tendency for children to answer earlier questions in the easier sub-tests, independently of the arrangement of the practical and academic items. These sub-tests were composed of items *all* of which might be answered by children of superior average ability. It seemed, therefore, that, as the whole sub-test could not be apprehended at a glance, children might answer items before they had read through the whole sub-test.

In order to provide a sub-test which could be more quickly perused, the 'meaning of words' test was compiled. Here each sub-test consisted of six words, three practical, three academic, against which the meaning had to be written, or a descriptive drawing made. The whole set of six words could be perused by very few eye movements. Some practical items, such as 'claw-hammer' were best described by a drawing and the children were told to make small drawings wherever they desired. There were nine sub-tests in all.

For marking purposes, verbal or graphic descriptions of correct function or appearances were scored and the correct response had to be a satisfactory definition by class and difference. It was found necessary to provide a marking key to guide markers. This key was similar in form to that provided by Slater for his Selective Vocabulary Test giving a list of correct and incorrect responses.¹ Although this form of test cannot be marked as objectively and quickly as the multiple choice form, it gains in the shorter space taken up for each sub-test, thus making for a more rapid comprehension of the items and so a valid assessment of interest.

¹ *Op. cit.*

Specimen sub-tests are given below :

MEANING OF WORDS.

Instruction.

Below are sets of six words. Beginning with Set I, first look through the six words and then select *three words only* and write the meaning of each of these *three* words in the space provided. Some words can best be described by a rough drawing. You will be told when to make a drawing but you can also make a drawing for describing any other words if you wish.

Attempt only three words from each set of six words.

SET 1.

- 1.—Monastery
- 2.—Brake
- 3.—Clawhammer (use words
and make a drawing)
- 4.—Actor
- 5.—Hacksaw (use words
and make a drawing)
- 6.—Optician

SET 2.

- 1.—Tenon saw (use words
and make a drawing)
- 2.—Parable
- 3.—Dovetail joint (use
words and make a
drawing)
- 4.—Architect
- 5.—Duet
- 6.—Coal Tender

III.—SCORING.

The answers answered correctly are scored and two scores are obtained from each test, the score on 'practical' items, denoted by P, and the score on academic items denoted by A. The difference $P-A$ would give an assessment of interest in the practical field. If the children attempted three items in each sub-test and gave correct responses to all items answered the difference score $P-A$ would suffice as the best measure of interest in the practical field, but, in fact, children may not be able to answer three questions from each sub-test and generally cannot obtain full marks on what they attempt. Thus given values of $P-A$, particularly small values such as $|P-A| \leq 2$, may arise from small P and A scores or from large P and A scores. In the latter case we seem to have the influence of greater general ability or wider general interest entering into the results. In order to correct for this and to refer all $P-A$ scores to a common basis, an alternative measure¹ of practical interest is obtained by using the scores $100 \frac{(P-A)}{P+A}$, where the factor 100 is introduced to avoid fractions.

IV.—AN EXPERIMENTAL STUDY.²

The two interest tests were given to 173 Northumberland boys aged 11+ from the top 30 per cent. of the ability range as determined by Moray House Intelligence, English and Arithmetic Tests. This group was selected as representing the class of children likely to be divided into technical and grammar school groups. The scores from each test were combined and the following frequency distribution obtained for the $100 \frac{(P-A)}{P+A}$ scores.

¹ More recent investigations have shown that the score $100 \frac{(P-A)}{P+A}$ is a more valid measure if the ability range of the children tested is narrow. The formula breaks down where a child is only able to make few, say, one or two correct responses, as was found common with C stream children. However, as a device for selection the use of such a test need only be limited to the upper ability ranges.

² Undertaken in co-operation with Miss Lambert, Northumberland Educational Psychologist.

TABLE I

SHOWING THE DISTRIBUTION OF PRACTICAL INTEREST SCORES. (POSITIVE VALUES REPRESENT PRACTICAL INTEREST, NEGATIVE VALUES ACADEMIC INTEREST.)

100	$\frac{P-A}{P+A}$	-95.5	-85.5	-75.5	-65.5	-55.5	-45.5	-35.5	-25.5
Frequency		1	5	10	8	12	24	22	19
100	$\frac{P-A}{P+A}$	-15.5	-5.5	4.5	14.5	14.5	34.5	44.5	54.5
Frequency		29	7	12	7	7	4	4	2

Mean interest score -26.4, \pm S.E. 2.42.
Standard Deviation 31.82.

From this table there is evidently a significant trend of interest in the group of boys as a whole away from practical topics, that is, the interest of the majority of boys tends towards academic topics. There may be at least two causes for this trend.

In the first place there may be a real bias in the population of boys towards academic interest, that is to say, the boys, thirty-six in number and representing only some 21 per cent. who obtained positive 100 $\frac{P-A}{P+A}$ scores represents the number of boys who possess marked technical interests. Evidence in favour of this theory is also contained in the statistics obtained from the validation of the items, which gave equal difficulty to the item selected for each sub-test.¹

On the other hand it may also be possible that the experience in a Junior School favours familiarity with the non-practical kind of item and that the items may be so biased as to favour an academic preference. If this were so, the real practical interest might be more evenly distributed through the population, and the true mean interest score would be nearer to zero. However, even if this were so we could still use the test as a relative measure and fix the percentile at whatever point was convenient for selection. In connection with this point we should note that we have no other evidence that practical interest is distributed equally with academic interest in the higher ability group which this population represents. It may be merely an administrative convenience for purposes of classification for secondary school to imply that the two interests, practical and non-practical, are equally distributed in the population.

The findings of Rallison² on the scientific and non-scientific interests of children are somewhat different from the results outlined in the above paragraph. This may be due to the different aims and methods used. He seems to be concerned with potential unrealized interests whereas in this paper we are concerned with interests which have been satisfied to some extent and have produced some permanent knowledge. Furthermore, Rallison is concerned with finding general trends of interest in the whole senior school population whereas the present problem is that of finding the differences shown in relation to two fields of interest in the narrow upper range of ability. Shakespeare³.

¹ Since in the validation the boys, representing a wide range of ability, answered as many items as they *could* and the item-difficulties were thus estimated on a basis of compulsion. Any bias which is subsequently revealed when *choice* is allowed might, therefore, be attributed mainly to the element of choice.

² RALLISON, R.: "The Scientific interests of senior school children," this *Journal*, Vol. IX, pp. 117-130, 1939, and Vol. XIII, p. 39, 1943.

³ *Op. cit.*, p. 152.

finds a uniform interest in 'subjects which allow bodily activity' but he also is concerned with broad trends of interests in the entire senior school.

Further evidence that the distribution of interest given in Table I relates to practical ability has been obtained by correlating the interest scores $100 \frac{(P-A)}{P+A}$ of the same 173 boys with their scores in individual practical ability tests and a Moray House Intelligence test. The practical ability tests used were two, the Alexander Performance scale and an unpublished practical ability test devised by the writer.¹ The correlation coefficients which were obtained are given in Table II.

TABLE II.
CORRELATION COEFFICIENTS BETWEEN PRACTICAL INTEREST AND :—

	<i>r</i>	S.E. <i>r</i>
Alexander's Performance Scale.....	.2490	.0713
Peel's Practical Ability .....	.2332	.0719
Moray House Intelligence	-.2609	.0708

The standard error of the correlation coefficient is used since the population is large and the coefficients small. From this table it is seen that significant correlation exists between interest and practical ability tests. The significant negative correlation with the Moray House Intelligence test confirms this statement, for if we had used the score $100 \frac{(A-P)}{A+P}$ instead of $100 \frac{(P-A)}{P+A}$ the above correlations would have remained unchanged except for their sign. Practical interest is, therefore, positively correlated with practical ability and academic interest positively correlated with general ability as estimated by a predominantly verbal test. It is considered that the polarity set up by the test may correspond to interest rather than ability because tests of practical ability and general ability invariably show positive correlation with each other. Also from Table II we have a test which has correlation of an opposite sign with each of these abilities and we have to some extent eliminated ability by the divisor $P+A$ and by testing a population of a narrow range of ability.

A more convincing experiment would be to follow up children tested by the interest test and correlate the results with teacher's assessments for practical work and interest. Such a criterion would be far more satisfactory than the practical ability tests used above.

¹ This unpublished test consists of thirty-one items assembled in two sub-tests. The items consist of four or five blocks of wood with irregular plane faces and the child is required to select two from each of the set of blocks to make a similar model to one prescribed in the first sub-test by a half scale model in cement, and in the second sub-test by a perspective drawing. Prior to taking the test the children are given a short period of training in the type of test they are going to undertake. The test is scored by items right or wrong and differs from the Alexander test in two important respects. In the first place it uses irregular solids, whereas Alexander's test is limited to rectangular and right angled triangular faces. Secondly, the scoring does not involve timing a child's performance on the items, the total time allowed for the test being arrived at after previous validations. The test has been used with a considerable number of children in conjunction with other performance tests, non-verbal tests and teachers' estimates of practical ability. It is hoped to write more of this research at a later date.

V.—CONCLUSION AND FURTHER APPLICATION.

By introducing the element of choice into information tests of interest it is possible to produce a marked polarity between interest in the practical and academic fields. The choice is easily effected by dividing the test into short sub-tests containing practical and academic items of equal difficulty and insisting on a choice. The technique is more valid when used on a population of boys representing a narrow range of ability.

The real nature of the test is masked to a great extent by the information nature of its items. It thus provides a genuine test stimulus.

Tentative correlation with practical ability tests and a verbal intelligence test shows that the polarity of interest does in fact correspond with some real difference in practical and verbal ability.

Several problems suggest themselves ; in particular whether it is possible to devise such an interest test to differentiate in the junior forms of grammar schools between scientific and non-scientific interest and mathematical and non-mathematical interest. For rural communities such a test might be set up to differentiate between rural outdoor interests and academic interests. Some of these problems have been suggested to M.Ed. students at Durham University as topics for research and are being followed up along the lines suggested in this paper.

SUMMARIES OF RESEARCHES REPORTED IN DEGREE THESES¹.

An Enquiry into the Factors Governing Membership of Youth Clubs and Juvenile Organizations.

By MARY Y. CAMERON.

*Summary of Thesis submitted in part-fulfilment of the requirements for the Degree of
Ed.B., Glasgow University, 1947.*

THE aim of this enquiry was to discover why so large a number of young people are not attached to any organization. To this end, a questionnaire was prepared, with questions relating to socio-economic level, position in family, hours of work, ambitions, and leisure-time pursuits and interests, and this was presented to 150 boys and 150 girls between fourteen and eighteen years of age. These included eighteen boys and eighteen girls attending secondary schools, nineteen boys and seventeen girls working in offices, seventeen boys and one girl trade apprentices, one girl housekeeper, and twenty-one boys and thirty-eight girls working in factories and shops, all of whom were Boy Scouts, Girl Guides, or members of youth clubs; and eleven boys and twenty-four girls attending secondary schools, four boys and eight girls working in offices, fifty-three boys who were trade apprentices or attending a trade school, and seven boys and forty-three girls working in factories and shops, none of whom was a member of any organization. The answers to the questions were tabulated and those of boys and girls, club members and non-members compared.

No significant difference appeared between club members and non-members in the answers to questions relating to socio-economic level, position in family, hours of work, or ambitions.

Club members tended to follow more active, non-club members more passive, pursuits. More club members played games, skated, attended billiard saloons, patronized ice-cream shops, attended dance-halls; more non-club members watched football matches and attended picture-houses more than twice a week. The difference in the numbers who played games and, amongst the girls, in the numbers who attended picture-houses more than twice a week was highly significant, the other differences barely significant.

* Choice of reading material showed a sharp sex distinction, boys and girls having almost no common ground, but there was no significant difference between club and non-club members. Twenty-six boys and only one girl read technical magazines or magazines relating to hobbies; forty boys and no girls read comic-cuts; sixty-seven girls and no boys read papers devoted to "women's interests" or "erotic bloods."

The passivity of the non-club members may be due to lower intelligence, poorer physical stamina, negative social attitudes, lack of intellectual stimulus, interest in non-group activities, or simply to lack of opportunity.

¹ These Outlines must be submitted through the Head of the Department in which the research was carried out.

BOOK REVIEWS.

Opportunity and the Deaf Child: IRENE R. EWING, O.B.E., M.Sc., and ALEX. W. G. EWING, Ph.D., M.A., with an appendix by MOLLY SEFTON. (University of London Press, 1947, ps. 252+X, 9s. 6d.)

This book, by two of the leading pioneers in this country on methods of diagnosing and teaching deaf children, is a most readable contribution to an important subject. Dr. and Mrs. Ewing have set out in a simple, sound, attractive way the various principles underlying the education of children suffering from various degrees of deafness.

The Ewings stress the importance of work quite early with young children suspected of deafness. They state that "the tests of hearing described in Chapter II make it possible to distinguish with certainty between mental backwardness and high note deafness by the time the child is three years old" (p. 37). They emphasize the need to create a watchful expectant pre-speech situation on which lip reading can be based, and they show how this can be achieved to help the child quite early to a small basic meaning vocabulary.

The importance of emotional factors in the learning situation are carefully noted, particularly in the discussion of home training for the under threes. The problem of the partially deaf child and the use of hearing aids is considered and guidance is given on procedure in using hearing aid equipment with younger and with older children.

The section on lip reading in the nursery school should be most helpful to both teachers and parents. I am not sure, however, whether on psychological grounds reading should be commenced so early with deaf children. Reading consists in recognition and discrimination of visual patterns of words, and recent research shows that with hearing children previous background of verbal experiences is an important factor in determining readiness for reading. It would seem that equally with deaf children we should aim at building up a satisfactory meaning background before introducing the pupils to abstract patterns, for they will only react correctly to usual patterns of words of which they know the meaning.

In the latter part of the book, Miss Sefton, deaf from birth, writes the most illuminating and interesting story of her life. Frequently her able analysis of her experiences points the way to methods with deaf children; for example, she shows how much participation in activity, associated with a situation, helped her to understand the meanings of words.

The book, because of its non-technical nature, should be most helpful to teachers and parents alike.

F.J.S.

The Teacher on the Threshold: E. R. HAMILTON. (University of London Press, Ltd., 6s. net.)

This is an excellent and inspiring little book. It is written by one who "really knows," for a definite group of people, and for a definite purpose. It is primarily for young men and women who are intending to become teachers.

There are twelve chapters in all. The first and second deal with the teacher himself and life. Chapters three to eight inclusive, glance penetratingly and sympathetically at human nature, especially human nature in the classroom. Chapters nine and ten are called "The Teacher and his Art."

The writer truly claims that though young teachers need advice it is only through their own thinking that they can be professionally saved. These two chapters are the means by which a practical life-line is thrown out, for, almost incidentally, many useful suggestions of a technical nature are provided. Chapter eleven discusses questions of a "Science of Education," and the final chapter provides "Food for Thought."

This book can be warmly recommended not only to intending teachers who can hope, as the author says, to write something, even if only a few paragraphs, in the Book of Education, but also to teachers who may be a little weary in their own efforts to contribute to such a book and in need of a "refresher."

Intelligence and Fertility: SIR CYRIL BURT. (Hamish Hamilton, pp. 43. 2s.)

The Trend of National Intelligence: GODFREY THOMSON. (Hamish Hamilton—pp. 35. 2s.)

These two publications of the Eugenics Society have an importance out of proportion to their small size. Each surveys, quite independently, a mass of evidence on their common problem, with conclusions which are in remarkable agreement and which challenge serious attention.

Burt's paper was prepared and published first (1946), but not before Thomson delivered his paper as the Galton Lecture for 1946; and this independence, I think, makes the papers all the more valuable, and the marked agreement in the main findings all the more striking—and ominous. Burt condenses into his short pamphlet a remarkably complete survey of many investigations, while naturally expounding his own more fully. He gives ample evidence that with the increase in the size of families we find a lower average intelligence of the children, the correlation between size of family and intelligence of children being a negative one, round about -0.24 .

Assuming there is no change in the present relative productivity of the various economic classes or various ranges of family intelligence, he concludes that the decline in I.Q. points per generation is probably nearer 1.5 than 3.0 (Cattell's figure) in urban areas, and probably about 2.0 in rural areas. The most serious thing, in Burt's opinion, is that in about fifty years time, if matters remain as at present, the number of children of scholarship ability (I.Q. over 130) will have been halved, and the number of feeble-minded (below I.Q. 70) almost doubled. The summing up is cautious and masterly; and Burt concludes by expressing the need for a direct testing of two successive generations.

Professor Thomson's lecture covers some of the same material but gives more attention to some Scottish results. It also is marked by clarity, and by a restraint which makes the conclusions all the more telling. Thomson's estimate is that the negative correlation between the intelligence of a child and the size of its family is approximately -0.25 , almost identical with Burt's estimate. The decline in the average intelligence he reckons to approximate to about two points on the I.Q. scale, which fits Burt's 'guess' of 'nearer 1.5 than 3.0.'

Thomson too indicates the need for a check of these estimates by a direct measurement of successive generations, and he reports that there is already under way a plan to test a complete age group of eleven years in Scotland, as was done fifteen years ago.

Clearly these two papers deserve very serious consideration by all who are concerned about our national welfare. C.W.V.

Intellectual Status at Maturity as a Criterion for Selecting Items in Pre-School Tests: KATHERINE M. MAURER. (The University of Minnesota Press, \$2.50.)

This is a useful report of a follow-up study among young people between 16½ and 22 years of age who were given the Army Alpha Test and had been given at least one Minnesota Pre-school Test sometime before the age of six.

of the selected items with the Alpha scores varied with the ages of the pre-school children tested. Rough averages for the two forms A and B of the Alpha Test were as follows :

For 22 children tested at $1\frac{1}{2}$, 2 or $2\frac{1}{2}$ —r was about 0.5.

For 33 children tested at 3, $3\frac{1}{2}$ or 4—r was about 0.25.

For 35 children tested at $4\frac{1}{2}$, 5 or $5\frac{1}{2}$ —r was about 0.32.

It should be mentioned that the children were, as a group, decidedly above average intelligence, being drawn largely from professional and other higher economic ranks. Hence some of the early tests, being passed by practically all the children, would fail to do themselves justice. Also the author admits that the Army Alpha Test is by no means ideal.

Seven to Eleven: Some problems of the Junior School: T. RAYMONT. (Longmans, Green and Co., pp. ii+88, 5s. net.)

This book, the author writes in the preface, "is not meant to be a complete treatise on the junior school, but rather a discussion of selected problems which appear to me fundamental." These main problems include individual differences, curricula, problems of method and the mentally handicapped. On all of these Professor Raymont writes with admirable clarity, well informed and balanced judgment, and with constant reference to practical problems in the school. The chapter on "The Exceptionally Gifted" though interesting, seems hardly to fit in with the rest. The psychological bases of work in the Junior School are dealt with only briefly, but the book would serve as an admirable introduction to the subject for the young student in training, or the young teacher in the Junior School.

The Personality of Man: G. N. M. TYRRELL. (Pelican, A.165, 1s.)

In view of the title of this book, it was hardly to be expected that it should turn out to be a non-technical explanation of the present position of psychical research, a summary of the results psychical research has so far gained, explanations of techniques for so-called "personality" investigation and samples of evidence for telepathy, foreknowledge, survival after death and poltergeists.

The author became President of the Society for Psychical Research in 1945, and it is useful and informative to have such an authoritative summary, with the author's views on the implications of the results of such research in relation to religious belief, to sociology and to the future.

A list of over one hundred books which may be consulted is appended.

The Personality of the Pre-School Child: WERNER WOLFF, Ph.D. (Published by Heinemann, pp. XVI, 331, 25s.)

The cover of the book makes the large claim that it is "The first comprehensive study of the personality of the pre-school child." The author gives a long list of references and makes many excerpts from other authors, the excerpts not always being critically examined or fully co-ordinated. He has a very confident belief in the invariable significance of what a child draws; thus "Persons and animals, and even objects which a child draws always stand for the child's inner problems," p. 131. To one who has watched the slow development of children's drawings from the earliest stages, and seen how they will try to draw *anything* which has recently interested them, this is very unconvincing.

There is a marked tendency to indulge in much speculative interpretation and generalization. An example of this is the statement that the development of social relationships goes through several stages which are listed as: (1) monologous state; (2) the state of discharge; (3) identification; (4) establishment of ideals; (5) possession; (6) competition; (7) directed love and aggression; (8) the demand for reciprocal action of love and aggression; (9) altruism; (10) co-operation.

It is true the author says they do not always appear in definite succession, but apart from the vagueness of some of these phrases, the inextricable mingling of several of these almost at the earliest stages of social relationships surely makes such a list of stages of little value.

OTHER PUBLICATIONS RECEIVED.

Criminal Justice and Social Reconstruction: by HERMANN MANNHEIM (pp. 290, 15s. 0d.)

Zwang Und Freiheit in der Erziehung: by HEINRICH MENG (pp. 239.)

Libido and Delusion: by LOUIS S. LONDON, M.D. (pp. 259, \$3.50.)

The Navaho: by CLYDE KLUCKHOHN AND DOROTHEA LEIGHTON (pp. 258, \$4.50.)

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So far, from the foundation of the Journal, the business side has been managed by the Editor, but the circulation has grown so much in recent years that the work needs the facilities of an established publisher. The Editor, with the full concurrence of the Board of Directors of the Journal, has arranged for Methuen to undertake the publication, and he feels that the Journal is fortunate in being adopted by a firm of such distinction.

The TWELFTH INTERNATIONAL CONGRESS OF PSYCHOLOGY will be held in Edinburgh, Scotland, from July 23rd to 29th, 1948. Full particulars may be obtained from the General Secretary, Professor Godfrey Thomson, Moray House, Edinburgh, 8.

THE DEVELOPMENT OF EDUCATIONAL RESEARCH IN GREAT BRITAIN.

PART III.—PRESENT FIELDS OF RESEARCH.

BY FRED J. SCHONELL

(*Professor of Education in the University of Birmingham*).

VI.—*Attitudes and interests.* VII.—*Content of curricula and teaching methods :*
(a) *Curricula and general methods ;* (b) *special teaching methods.*

VI.—MEASUREMENT OF ATTITUDES AND INTERESTS.

A REVIEW of the development of educational research in Great Britain during the last half century reveals how the problems studied, in addition to providing new information, reflected the thought and attitudes of the time. Thus the early experimental work of the century was concerned mainly with investigations into teaching methods or with examinations of the disciplinary or mental value of school subjects. Then as the emphasis in teaching began to shift from "Latin" to "John" there came an increased volume of experimental work on the mental abilities of children, the most extensive of which research was that dealing with intelligence testing. And then later, as the influence of the teachings of Freud, Jung and Adler extended and the importance of the emotional life of an individual was expounded by eclectic teachers in this country, and as this, in turn, was linked up with results from scientific child studies, it was realized in educational circles that, in addition to the cognitive side of John's learning powers, note must be taken of his affective-conative responses,¹ in particular of his attitudes² and his interests.

This has been reflected during the last fifteen years by the development of research into attitudes of pupils towards different aspects of school and home life. There have been investigations of attitudes towards school work, towards school subjects, towards rules and regulations, towards parental responsibilities, towards examinations and towards various social ideas and opinions held by the pupils themselves.

Measurement of Attitudes.

Problems in this field have been examined in a number of different ways,³ namely by (a) direct observations of behaviour ; (b) recording of opinions as expressed at interviews ; (c) real life situation tests ; (d) analysis of personal records, e.g., letters, compositions, autobiographical data ; (e) case studies ; (f) questionnaires ; (g) rating schedules ; (h) ranking of opinions.

¹ A careful survey of measurement in this field is given by P. E. Vernon in *The Assessment of Psychological Qualities by Verbal Methods* (H.M.S.O., London, 1938).

² Allport defines an attitude as "a mental and neural state of readiness organised through experience, exerting a directive or dynamic influence upon the individual response, to all objects and situations with which it is related." *Handbook of Social Psychology*, Ed. Carl Murchison, Chap. 17, "Attitudes," by G. W. Allport (Clark Univ. Press, 1935).

Thurstone and Chave define it as "a generalised reaction for or against a specific psychological object." Thurstone, L. L., and Chave, E. J., *The Measurement of Attitude*, p. 96. (Univ. of Chicago Press, 1932).

³ There has been in this country less attention devoted to research into attitudes than in the U.S.A. where there is now a considerable body of literature on attitude findings and on techniques connected with attitude testing. See for example *Review of Educational Research*, "Psychological Tests and Their Uses," Vol. VIII, 3, June, 1934 ; Vol. XI, 1, February, 1941 ; Vol. XIV, Feb., 1944, and Vol. XVII, 1, Feb., 1947.

Of the objective methods used for investigating attitudes those of Likert¹ and Thurstone and Chave² have been most generally used (with appropriate modifications) in this country. For example in the Likert method use is made of two alternative approaches to the assessment of an attitude. The first of these consists of arranging five statements in order of the strength of the attitude³—from positive to negative—and then requiring the testee to select the statement which most nearly fits his attitude.

The second approach consists in asking the testee to select a response to each one of a number of statements in terms of *one* of five possible grades of attitude towards the statement—i.e., ranging from (a) I agree most strongly; (b) agree, but not so strongly; (c) am doubtful or undecided; (d) disagree, but not very strongly; (e) entirely (or strongly) disagree.

The responses from a group of testees for each statement or set of statements are first calculated in percentages and then translated into standard deviation values.⁴

In general it should be noted that attitude testing may have marked limitations, and there have been a number of American studies reporting low validity values for such types of tests. Validity varies with the nature of the topic being examined—we get greater validity where there is less likelihood of disparity or differences in intensity between the situation represented by the attitude test statements and those situations likely to be experienced in real life. However, on the whole the attitude scale has shown itself to be a valid measuring instrument, provided precautions are taken in respect to the technique employed for particular data and the fields in which it is used.⁵ Obviously group attitude test findings may obliterate most significant individual attitudes. More valid results are obtained when the tests are used with older than with younger pupils and with intelligent than with unintelligent pupils. Results from recent work⁶ carried out in the Department of Higher Degrees at the Institute of Education, University of London, under Professor H. R. Hamley, indicate that adapted attitude testing might provide one of the best methods of personality assessment.

Forrester⁷ devised a modified form of the Likert technique for use in schools by framing her statements to take the form of a discussion about certain points between a group of named boys and girls. The testees in this case were required to say with whom they agreed. Forrester also found that she obtained

¹ LIKERT, R.: "Technique for the Measurement of Attitudes," *Archives of Psy.*, 1932. Also *J. of Social Psy.*, 1932.

² THURSTONE, L. L. and CHAVE, E. J.: *The Measurement of Attitude* (Chicago, 1932).

³ This is usually done by submitting the statements in the first place to a panel of judges and requiring them to mark them as A, B, C, D, E. Modifications are made, on the basis of these results, to statements which require strengthening in some way.

⁴ The responses to the statements about the attitudes vary from degrees of approval to degrees of disapproval and roughly approximate to a normal distribution. The percentages obtained for the degrees A, B, C, D, E from the test population are changed into standard deviation scores, assuming that the numbers are "ordinates" of a normal distribution of -3σ to $+3\sigma$ range.

⁵ Those interested in the attitude test as a measuring instrument might consult—MITCHELL, C.: "Do Scales for Measuring Attitudes Have any Significance?" *Journ. of Ed. Research*, Feb., 1941, Vol. 34, No. 6; BONNEY, M. E.: "The Validity of Certain Techniques of Gathering Psychological Data with Special Reference to Personality Questionnaires," *Journ. of Social Psy.*, 1941, 13, 103-122; ELLIS, A.: "The Validity of Personality Questionnaires," *Psy. Bulletin*, 1946, 43.

⁶ This is being supplemented by work at present in progress.

⁷ FORRESTER, J. F.: "A Study of the Attitudes of Adolescents to their own Intellectual, Social and Spiritual Development," (Ph.D. Thesis, 1946, Univ. of London Library).

FORRESTER, J. F.: *Loc. cit.*, p. 124.

better results from a choice of three statements, one favourable, one neutral, and one unfavourable. She investigated the attitudes of 157 adolescent boys and 189 girls, between the ages of 13 and 17, towards adventure, security, rights, responsibilities, growth and religion. The statements for her attitude tests were based on the replies of adolescents to twelve different questions on the above fundamental topics—thus she asked questions such as "What kind of things make you feel secure?" "In what way do you feel you would like to grow?" "What are, to you, the duties of human beings?" "What is your idea of God?" "What do you mean by sin?"

The answers to the twelve questions were provided by approximately 200 girls between the ages of 11 and 18. Dr. Forrester's observations on the replies have particular significance for those investigating the assessment of character and personality; she says "these answers were delightful for their freshness, frankness and simplicity, and a most revealing source of information both about the ideas and outlook of the girls and their power of expression."

The reliability coefficients of her final attitude tests on the various topics (except religion), as determined by repetition of the tests after an interval, were, attitude towards adventure 0.83, towards security 0.84, towards growth or development in different fields 0.9, towards rights 0.87, and towards responsibilities 0.93. An interesting aspect of the work is that she demonstrated the validity of the method of attitude testing by reconstructing successfully the characters of pupils from their responses. The checks obtained from the teachers' estimates showed remarkable agreement.

Forrester's research is important not only to psychologists but also to teachers in their day-to-day contacts with adolescent boys and girls. She found that *all* adolescents are conscious that they are involved in some kind of development, and there is considerable variety in the directions in which they are sensitive to change, some for example "feeling more conscious of intellectual development than social or spiritual, others are more aware of progress in making social contacts than in their independence of the opinions of other people."¹ That *all* adolescents are conscious of development is one growing point for education, that they all *desire* to develop in some direction is an even more vital one. For it emphasizes what educational psychologists have been preaching so vigorously, that there is no child without something in him that will respond if he is provided with opportunities in the right situations. Of the 639 boys and girls who answered various attitude tests, at various stages of the research, the desire to develop physically is most marked, but there is also a strong desire for more knowledge, both of people and of things, and a wish to find a purpose and meaning in life. Forrester showed that the directions in which an adolescent desires to develop, as indicated by the attitude tests, are an indication of his scale of values.

Of attitudes towards adventure the research revealed that adolescents show the most positive attitude towards mental adventure—"the learning of new facts and the discovery of them by their own efforts, adventure in work, that is, the finding of work in life that will give them new experience." There is a most marked rejection of the routine job.

The tests also show a very positive attitude on the part of all adolescents towards sources of security, mental, moral and social. While the girls show a positive attitude towards the possession of a religious faith as a source of security the boys on the whole, especially older ones, do not.

One interesting aspect of the research which dealt with attitudes of adolescents between 13 and 17 is the fact that there are very few differences

¹ FORRESTER, J. F.: *Loc. cit.*, p. 374.

in attitudes (with the exception of religious attitudes) between boys and girls and older and younger adolescents. It would be useful if this finding could be checked with larger numbers drawn from groups of markedly different socio-economic backgrounds, because it has a most important bearing on educational methods in secondary schools. As Forrester observes "within age groups it is possible to find children with the most diverse views. It is possible to find an eleven-year-old and a sixteen-year-old whose attitudes are more alike than two of the same age group. This suggests that the chief reasons for differences in attitudes may be not age or sex but personality differences which go back to constitutional or environmental differences.¹ This immediately opens up possibilities of many fascinating studies. What kind of home life produces the most positive attitude towards the various topics? What makes a child eager to meet new people or what makes him shrink from doing so? What kind of school organization helps or hinders?" No doubt attitude-testing pursued in relation to such questions would extend our knowledge of our pupils, for as Forrester observes in this connection, "it is not without significance that the two children from those selected for case studies who show the most negative responses in the attitude tests are those with unhappy home backgrounds."

Two useful attitude studies which supplement that of Forrester are those of Glassey² and Drummond.³ Glassey investigated certain attitudes in grammar school pupils and their parents, using a modified Thurstone and Chave technique. His results are based on 300 grammar school pupils (11 to 18) and 348 parents, and he gave correlations between the attitudes of mothers and fathers with those of their children. The comparatively high correlation of .57 between mothers' and girls' attitudes to education is interesting. In general he found that the child's attitude was more closely related to that of the mother than the father.

Drummond used attitude tests of a verbal and pictorial kind to investigate the attitudes of backward pupils towards school life and work. She found the following correlations:

	<i>Attitude (lessons).</i>	<i>Attitude towards School Work.</i>
Mental Age.....	.33 ± .065	.37 ± .063
I.Q. ....	.40 ± .062	.35 ± .065
Educ. Age .....	.25 ± .069	.29 ± .067
Educ. Quotient .....	.27 ± .069	.34 ± .066

On comparing normal, backward and dull groups by examining the differences between the mean attitudes by means of an analysis of variance she found certain significant differences between normal and dull pupils and between backward and dull pupils. Dull children were more apathetic than normals⁴ while there was greater resentment in the attitude of dull boys and

¹ A most useful consideration of some of these problems from the psycho-analytic viewpoint is given in Flugel's book, *A Psycho-Analytic Study of the Family*. The reader will also find additional information in *Origins of Love and Hate*, Suttie, I. D. (Kegan Paul, 1936).

² GLASSEY, W.: "The Attitude of Grammar School Pupils and their Parents to Education, Religion and Sport" (M.A. Thesis, Univ., of Manchester, 1942).

³ DRUMMOND, G. A.: "The Attitude of Backward Adolescents towards their School Life and Work" (M.A. Thesis, Univ. of London, 1947).

⁴ Highfield found that more secondary modern school pupils, especially boys, had a more apathetic attitude towards their school work than younger groups.

more over anxiety in the attitudes of dull girls. Drummond's work needs repetition with larger numbers of testees.

Other studies which have dealt with social or personality traits by means of adapted attitude tests have been those of Crocket,¹ Davis,² Winterbourne,³ and Brahmachari.⁴

Results of the assessment of attitudes towards school subjects have been instructive and illuminating, and research has ranged from simple tests of preferences for subjects at various ages⁵ to detailed investigations based on attitude tests. In general, orders of preferences for subjects have shown that activity subjects such as singing, physical training, woodwork, handwork, rank high, while more abstract (and usually less well taught subjects) such as hygiene, grammar, physics, Latin, geometry, religious knowledge⁶ rank low. But there are interesting differences between the sexes and, as Shakespeare showed, between able and less able pupils.

Of the more detailed analyses of attitudes towards school subjects one may cite the work of Jordan⁷ as an excellent example. Using a modified Thurstone and Chave technique, Jordan investigated the attitudes of 231 pupils between the ages of 11 and 15 towards French, mathematics, history, English, and geography, and the correlation between attitude and attainment.

The mean attitude scale scores for the subjects from eight different school forms was French,⁸ 5.85, English 6.92, History 6.39, Mathematics⁹ 6.53, Geography 6.63, but this result, although giving some indication of preference, is illuminated by consideration of form to form preferences, particularly those of younger pupils compared with older ones, and the more able compared with less able, and by the qualitative statements of the pupils. As Jordan indicates, the attitudes of the pupils have a distinct bearing on teaching methods.

¹ CROCKET, HELEN E.: "An Investigation of Social Attitudes in School Children" (Ph.D. Thesis, 1940, Univ. of London Library).

² DAVIS, JOAN: "A Study of Confidence in a Group of Secondary School Children" (M.A. Thesis, 1944, Univ. of London Library).

³ WINTERBOURNE, R.: "An Investigation into the Development of the Attitude of Children Towards Authority" (Ph.D. Thesis, 1941, Univ. of London Library).

⁴ BRAHMACHARI, S.: "Moral Attitudes in relation to Upbringing, Personal Adjustment and Social Opinion" (1938, Ph.D. Thesis, Univ. of London).

⁵ For elementary school pupils, see "An Enquiry into the Relative Popularity of School Subjects in Elementary Schools," Shakespeare, J. J., *Br. Journ. Ed. Psy.*, June, 1936.

For secondary school pupils, see "The Relative Popularity of Secondary School Subjects," Pritchard, R. A. (*Br. Journ. of Ed. Psy.*, June and November, 1935).

⁶ It is a far-reaching indictment of the nature of the teaching in the subject that scripture is consistently at or near the bottom of lists. The causes are fairly obvious, but if the teaching of scripture is to be improved and there is evidence that it can be made as interesting as any other subject, then it should be realized that those with the most knowledge in the subject are sometimes the least effective in determining what should be taught or how it should be taught. The ineffectiveness of instruction in religious knowledge is an example of allowing subjective and emotional considerations to determine teaching content and method. For scripture teaching to be successful and interesting it is necessary to take into consideration the psychologists' knowledge of children, of their mental characteristics and capabilities, particularly what they are capable of understanding at a given age. Many lessons in scripture fail because children are presented with material which they are incapable of understanding at that age.

A few general points on religious education emerge from Moreton's Study, "Attitudes to Religion Among Adolescents and Adults" (*Br. Journ. Ed. Psy.*, June 1944).

⁷ JORDAN, D.: "The Attitude of Central School Pupils to certain School Subjects, and the Correlations Between Attitude and Attainment" (M.A. Thesis, 1937, Univ. of London Library; also *Br. Journ. of Educ. Psy.*, Feb., 1941).

⁸ See also "A Study of the Effects of Learning French on Attitudes towards the French," Sutherland, M.B. (B.Ed. Thesis, Glasgow Univ., 1945).

⁹ See "Children's Attitudes towards Arithmetic," Freeman, S. (M.A. Thesis, 1948, University of Birmingham). Freeman examined attitudes of boys and girls of different ages towards different kinds of arithmetical exercises.

The correlations between attitudes and attainments for the subject were French .26, Mathematics .33, English .25, History .21, and Geography .21, positive, and hence suggestive, but small.

A useful investigation of parental attitudes towards certain aspects of child upbringing was recently completed by Highfield, using an attitude scale.¹ In this field mention might also be made of work by Moreton,² Burt³ and Wall.⁴

(b) *Interests.*

The relationship between interest and effort has long been recognized, but as yet insufficient attention has been paid to discovering the exact interests of pupils at various ages, and still less of harnessing the emotional energy from these interests to methods of teaching and contents of curricula. Certainly some improvement has been achieved in science syllabuses, particularly in secondary modern schools, by noting the interests of boys and girls. Investigations into scientific interests have been made by Rallison,⁵ Ottaway,⁶ Richards,⁷ Comber,⁸ Simmonds,⁹ and Glenister,¹⁰ and these have influenced curricula in particular schools, but mainly in biology and general science.

Reading interests¹¹ of pupils have received comparatively little attention except for Jenkinson's useful work. How much we could assist pupils in the development of their reading and in improving their liking for reading if we took note of the facts in regard to reading interests and reading requirements at various ages is shown by the information gathered by Jenkinson.

His conclusion is that that "a large supply of books and no teaching would produce similar or better results than our present system of much teaching based on a few books, and that a rich supply of books chosen with the cunning derived from knowledge and foresight, together with occasional stimulus from a teacher would produce much better results."¹² We require a similar survey of the reading interests of junior school children.

An estimate of interests may be obtained through written questions asked by pupils of all ages, as evidenced in a very useful investigation by Simson.¹³

¹ *The Young School Failure*, Highfield, M. (Oliver and Boyd).

² "Attitudes of Teachers and Scholars Towards Education" Moreton, F. E. (*Br. Journ. of Ed. Psy.*, June, 1947).

³ "An Enquiry into Public Opinion Regarding Educational Reform" (*Occup. Psychology*, Oct., 1943, and Jan. 1944).

⁴ "Opinions of Teachers on Parent-Teacher Co-operation," Wall, W. D. (*Br. Journ. Educ. Psy.*, June, 1947).

⁵ "Scientific Interests of Senior School Children," (*Br. Journ. Ed. Psy.*, June, 1939) : "The Interests of Children in Non-Scientific Subjects," Rallison, R. (*Br. Journ. Ed. Psy.*, Feb., 1943).

⁶ "An Experimental Study of Biological Interests of School Children," Ottaway, A.K.C. (M.A. Thesis, 1935, Univ. of London).

⁷ "The Interests of Boys in the Junior Forms of a Secondary School in relation to the Teaching of Science" (M.A. Thesis, 1939, Univ. of Wales).

⁸ "The Scientific Interests of Children in Relation to the Teaching of Science" (M.A. Thesis, 1938, Univ. of London).

⁹ "A Comparative Study of the Scientific Interests of Adults and Boys of the Same Social Class" (M.A. Thesis, 1936, Univ. of London).

¹⁰ "Scientific Interests of Girls" (M.A. Thesis, 1932, Univ. of London).

¹¹ *What Children Read*: Jenkinson, J. A. (Methuen).

Also *The Education of Backward Children*, Chap. VI, by Schonell, F. J. (Evans Bros.). Report on Children's Reading, East Ham Public Libraries, 1934 (very comprehensive, deals with reading interests up to 13 years); *Reading and other Interests of School Children in St. Pancras*, 1933, Engledow and Farr; also the article by W. D. Wall on "Newspaper Reading," in this number of the *Journal*.

¹² P. 155, *What Children Read*.

¹³ "An Enquiry into Curiosity as shown in the Written Questions of Children and Adolescents," Simson, W. A. (M.A. Thesis, 1946, Univ. of Birmingham).

Leisure interests of pupils have been examined, but here again the information has had little influence on methods and curricula formation in schools. Relevant here are the studies of James and Moore,¹ Hammond,² Schonell,³ Wall and collaborators.⁴

The research of the last named workers is of value to educationists for it deals quite extensively with the cinema interests of over 1,200 adolescents between the ages of 13 and 16·11. This research was unique in that it represented a piece of team work, under the guidance of Dr. W. D. Wall, by twelve teachers who had completed their M.A. degrees in Education in the University of Birmingham. Data was gathered by questionnaires and essays on the frequency of attendance at the cinema, days of the week favoured, preferences for kinds of films seen, their emotional effects, the relation of cinema going to other leisure pursuits, and the relation of the intelligence of pupils in secondary modern schools to frequency of cinema attendances. The pupils taking part in the investigation came from secondary modern, technical, commercial and grammar schools.

It is not possible in this space to include all the findings⁵ of this valuable socio-educational survey, but in all groups (age or education), the proportions of boys attending the cinema twice a week or more are greater than those of girls. In secondary modern groups, of boys and girls, well over half attend at least twice a week, as compared with grammar school groups, rather less than one third of which attend twice or more a week. Week-end attendance is greatest with over a quarter of secondary modern boys attending on Sundays.

Preference in all groups is on the whole for technicolour films. Films seem to stimulate the desire to read "the book of the film," but on the whole the film is preferred to the book. The trailer seems to be by far the most important method of selection, over 70 per cent. in each subdivision. Newspaper-criticism though a long way behind occupies second place and seems to be increasingly consulted with increasing age.⁶ Pictures outside the cinema and what other people say are relatively unimportant.

The emotional effects of the cinema seem to decline with age and to be less in grammar than in secondary modern groups. This and other sections on types of films preferred are of psychological interest. The research seems to indicate that frequency of attendance diminishes, rather than emphasizes, any ill effects that the cinema might have emotionally. Few admit that anything in the films stayed in their thoughts for a long time though there is some evidence that erotic fantasies are stimulated and given a direction temporarily by characters portrayed on the screen.

Finally a field of interests with some significance for the teacher in secondary schools and for vocational psychologists are the vocational interests and

¹ "Adolescent Leisure in a Working Class District," (1940, XIV, and 1944, XVIII). James and Moore examined both week day and week end leisure activities of adolescents, boys and girls, between the ages of 12 and 16 by means of diaries kept by the pupils. Also "Educational Interests of a Group of Industrial Workers," W. D. Wall (*Br. Journ. Ed. Psy.*, Nov., 1945).

² *An Analysis of Youth Centre Interests*, Hammond, W. H. (*Br. Journ. Ed. Psy.*, Nov., 1945).

³ *The Education of Backward Children*, Schonell, F. J., pp. 53-54 (Evans Bros.).

⁴ To be published shortly.

⁵ These conclusions are kindly communicated to me by Dr. W. D. Wall.

⁶ In this respect teachers might help pupils by linking certain aspects of English with critical assessment of films. See for experimental work of this kind, *Citizenship through English*, Laurence, M., 1944 (Oliver and Boyd). *Reading, Film and Radio Tastes of High School Boys and Girls*, W. J. Scott, New Zealand Council for Educ. Research (Oxford Univ. Press).

preferences of adolescents. Representative of studies of this kind are those of Austin,¹ Valentine and Ritchie², Mercer,³ Freeston,⁴ Stephen,⁵ Pallister,⁶ but those requiring a fuller consideration of the problem will need to consult American research, particularly Strong's monumental volume *Vocational Interests of Men and Woman*.⁷

Finally, an interesting piece of work involving a survey of the growth of sentiments, into which both attitudes and interests enter, is that of Margaret Phillips,⁸ who gathered her information about the life histories of some 400 different sentiments, social, intellectual, aesthetic and religious, as outlined by 275 people of varying ages from different occupations. Her collaborators described in detail the stages of development of the sentiment, the sources from which it derived and the value of the satisfaction obtained from it.

In conclusion the evidence from this section reveals the importance, for educational purposes, of the development of research into attitudes and interests, for not only is it vital to establish the fact that although abilities influence attitudes yet also attitudes determine, in part, the functioning of abilities, but it may well be that a more adequate assessment of personality traits lies through improved forms of attitude tests, both verbal and pictorial.

More adequate studies of pupils' interests will aid us in their educational guidance, and more extensive use of pupils' interests would produce greater improvement in application and learning by pupils. What is now needed are not further cross sectional studies of interests but careful longitudinal studies of the interests of selected groups of pupils in junior and secondary schools to show how these may be linked up with school learning situations related to different subjects. My own limited experience of this kind of continuous recording of the interests of children over a number of years has revealed the immense fund of energy that lies behind these emotional drives, and the vast amount of reading, classification, construction and even calculation children will do if it is in furtherance of some interest. The follow-up of interests reveals the extensive fund of knowledge and ability children develop if interests are adroitly and skilfully fed with the right material at the appropriate time.

Without doubt, the most useful direction in which we could obtain supplementary information that would make allocation of pupils at 11+ to forms of secondary education more effective is to give the pupils opportunity to pursue interests strongly and with guidance in the junior school. Far from transferring very intelligent, but immature, pupils of 10+ to secondary grammar schools there is every indication that *all* pupils, intelligent and

¹ An Analysis of the Motives of Adolescents for Choice of the Teaching Profession," F. M. Austin (*Br. Journ. Psych.*, Vol. I, Part I, 1931).

² "An Enquiry as to Reasons for the Choice of Occupations Among Secondary School Pupils," Valentine, C. W., and Ritchie, F. M. (*Forum of Educ.*, June, 1927).

³ "Some Occupational Attitudes of Girls," E. Mercer (*Occup. Psy.*, Vol. XIV, No. 1, 1940).

⁴ "Vocational Interests of Elementary School Children," Freeston, P. M. (*Journ. Occup. Psy.*, July, 1939); "The Influence of War on Juvenile and Adolescent Vocational Interests," Freeston, P. M. (*Journ. Occup. Psy.*, July, 1946).

⁵ STEPHEN, J. L.: "Occupational Interests in Relation to Intelligence" (M.A. Thesis, 1938).

⁶ "Vocational Preferences of School Leavers in a Scottish Industrial Area," H. Pallister (*Br. Journ. Psy.*, XXIX, Oct., 1938).

⁷ E. K. STRONG: (Oxford Univ. Press, 1943). See also C. S. Myers' critical review in *Occup. Psy.*

⁸ *The Education of the Emotions*, M. Phillips (Allen and Unwin). Also "The Development of Social and Political Sentiments in Women" (*Br. Journ. Educ. Psy.*, Nov., 1935).

unintelligent alike, would benefit greatly if we enriched the junior school curriculum to provide fully for the full development of interests, and then kept children in junior schools until they were 12+.

VII.—CURRICULUM CONTENT AND TEACHING METHODS.

The nature and amount of experimental work in curriculum content and teaching methods has been fairly considerable, particularly if one takes into account the research done for higher degrees in education or educational psychology at Universities (almost one-third of the total number of theses presented are on teaching methods). But few of the results from these numerous investigations have found their way into publication, and still less of the available material has been translated into a form in which it could influence, or be used by, the teachers in the schools.

In addition experimental work has been done by practising teachers in the course of their everyday work, and while much of this has not been, or could not be, assessed by acceptable objective methods yet some of it has been experimental in the best sense of the word. Such, for example, is the work going on in a particular junior school in Birmingham in which the curriculum contains a most generous provision for the artistic and dramatic expression of the children. This school experiment would hardly admit of effective assessment by objective means. Certainly one can observe and assess the excellent dramatic productions of the pupils, their dancing and the outstanding mural paintings that cover most of the space of the school walls. One can observe clearly in the murals the influence of the pupils' experience of expression through dance and drama. And again, one has evidence of the almost complete absence of disciplinary difficulties in the school, although it is situated in a "very poor area." But on the other hand, something which is evident, but which cannot be measured, is the poise and adjustment, the happiness and sociability, the interest and intense application of the pupils—elements in personality development which are of much greater value as a preparation for life than the objectively assessed arithmetic they do or the history they learn.

It is necessary in reviewing research into curricula and methods to be aware of this other body of experimental work, often unrecorded and unrecordable in objective terms, but none the less valuable for educational purposes.

Thus there are three forms of research reports on curriculum content and teaching methods.

- (a) *Descriptions* of experimental procedures in schools.
- (b) Experiments in *general methods*, with both qualitative and quantitative assessment.
- (c) Experiments in *special teaching methods* in the various school subjects.

(a) *Descriptive experimental work.*

Educational journals contain from time to time useful descriptions of experimental work being carried out in schools,¹ but not infrequently the useful-

¹ Examples of this are reports by teachers of experimental work in the *New Era*, July-August, 1939. Also "Pottery in a Country School," L. Amos (*New Era*, Dec., 1937); "A Youth Welfare Centre," H. E. Clinkard (*New Era*, Nov., 1939); "The Family Class," K. Bartlett (*New Era*, June, 1946); "An Incidental Approach in the Primary School," F. W. Parrott (June, 1947); "East Barnet Day Continuation School," A. S. Vaughan Thomas (*Journ. of Educ.*, Aug., 1946). An excellent example of the fuller type of descriptive report is that of Dr. W. S. Flack, "An Experimental Farming Camp School" (*Br. Journ. of Educ. Psych.*, Feb., 1945.)

ness of these accounts is limited for those who wish to follow similar lines, by lack of vital objective details—the age of the pupils concerned is omitted, the sources from which the necessary material can be drawn are not given, the early ‘snags’ of the experiment are not reported. What most educationists desire is more of these first-hand accounts by teachers engaged in experimental approaches, but reported more effectively with more helpful details.¹ One of the functions of the newly formed Institutes of Education may be to assist teachers, in an advisory way, with such work and to arrange for reports of useful school experiments in their areas, following, in a general way, an agreed pattern of report, for much ‘living’ experimental work lies hidden in various parts of the country. Then there are of course the useful, longer descriptions in books written about schools and their methods, examples of which are those of Wellock,² Boyce,³ Warr,⁴ Curry,⁵ and Happold.⁶

(b) *Experiments in General Method.*

The volume of reported experimental work on *general* method and on changes in curriculum content is slight, due no doubt to (1) the time required to test modifications in these school factors; (2) the variables in the situations, and lack of knowledge about adequate assessment of such experiments; (3) the demand that such work makes on a single research worker. Two conclusions thus arise from a review of developments in this field of educational research; firstly that experiments on general method and curriculum content should be carried out as team work, in the way the excellent research sponsored by the Scottish Educational Research Council is carried out by panels of interested workers (teachers, psychologists, students). Secondly, greater use should be made of the statistical method known as the analysis of variance and covariance.⁷ By this method we can analyse the variability (and hence to some extent assess causal relationships) of combinations of various school methods, or influencing forces, in experimental situations of varying kinds. For example, we could examine the relative efficiency of various forms of extra class activities such as visits, lecturettes and discussions, and centres of interest for training in social knowledge, as compared with more formal lessons, with pupils of varying ages and varying intellectual levels in a number of classes in different schools. Variance can be calculated in respect to pairs of factors, forces or conditions for classes in the same school and in different schools.

¹ Information of this kind from other countries is shortly to be published in *The International Year Book of Experimental Education*, V. Mallinson (Heinemann).

² *A Modern Infant School*, E. Wellock (Univ. of London Press, 1937).

³ *Play in the Infants' School*, E. R. Boyce (Methuen).

⁴ *The New Era in the Junior School*, E. B. Warr (Methuen).

⁵ *Education for Sanity*, W. B. Curry (Heinemann).

⁶ *Citizens in the Making*, A. C. Happold (Christophers).

⁷ See *Factors of the Mind* (p. 271-288), C. Burt (Univ. of London Press). Burt has also set out very clearly in the *Br. Journ. Educ. Psych.*, Nov., 1946, pp. 129-131, a most useful appendix on ‘The Applicability of Analysis of Variance to Educational Problems.’ See also an example in *Br. Journ. Educ. Psych.*, XV, II, 1945, pp. 86-89. Discussion of the method applied to educational problems is to be found in *Statistical Analysis in Education*, pp. 87-205, E. F. Lindquist (Harrap and Co.).

See too ‘Recent Developments in Statistical Method,’ C. Burt (*Occup. Psych.*, XII, iii).

Published examples of educational research using analysis of variance (now commoner in higher degree work) are those of Burt and Lewis. See ‘Teaching of Backward Readers,’ (*Br. Journ. of Educ., Psych.*, Nov., 1946), and ‘The Efficiency of Different Methods of Marking Composition’ (*Br. Journ. of Educ. Psych.*, Nov., 1939, Feb., 1940.)

Examples of experimental work on general method descriptively reported are those of Fletcher and Cons,¹ Daniel,² Glover³ and Taylor.⁴ Of research which included the use of objective tests and statistical treatment of results, we may cite as examples reports by Gardner,⁵ Schonell,⁶ Vernon,⁷ Price,⁸ Uprichard,⁹ and Thomson.¹⁰

Miss Gardner's research merits the careful consideration of those who are planning experiments in general method. She investigated different methods in infant schools by means of experimental schools and control schools. In the former there was liberal provision for free activities with some postponement of formal work, while in the latter, play activities did not occur, except sporadically on certain Friday afternoons, during the school week, and systematic teaching of reading and number was given as soon as the pupils were five years of age. Paired groups of children were given various psychological tests at various stages during the investigation, and the results were compared and checked for statistically significant differences between the experimental and the control schools. There was little doubt from the results obtained that the use of the free activities and spontaneous interests of pupils in an infant school, with some postponement of formal work, greatly benefits children when they come to the junior school. In the main the free activity school produces pupils of greater initiative, more independence, with greater enthusiasm for learning, and better understanding of what they have learned.

It would be of great value if more research of this kind could be carried out in respect to methods in junior and secondary modern schools.¹¹

(c) *Special Teaching Methods in School Subjects.*

Experiments dealing with the teaching of school subjects are numerous, and those working in this field should consult Mrs. Blackwell's list of degree thesis¹² teaching topics, and also Dr. C. M. Fleming's useful survey¹³ of

¹ *Actuality in School*, C. Fletcher and G. Cons (Methuen, 1938).

² *Activity in the Primary School*, M. E. Daniel (Basil Blackwell, 1947). An excellent illustrated account of activity methods in the primary school.

³ *New Teaching for a New Age*, A. H. Glover (Nelson, 1946). Deals with methods of relating school to the pupil's environment and of schemes of work based on the various projects.

⁴ *Experiments with a Backward Class*, E. Taylor (Methuen, 1947).

⁵ *Testing Results in the Infant School*, M. E. Gardner (Methuen).

⁶ "Broadcasting in the Senior School," F. J. Schonell (*Br. Journ. Educ. Psych.*, Nov., 1935).

⁷ "The Film in Instruction of Adults," P. E. Vernon (*Br. Journ. Educ. Psych.*, Nov., 1946). Useful as an example of analysis of variance and covariance applied to a problem of general method.

⁸ "Emotional Development and the Infant School, the extent to which a play curriculum may aid Emotional Adjustments," A. F. Price (M.A. Thesis, Leeds, 1940).

⁹ "The Relation between Interest, Aptitude and Achievement—An Account of a Curriculum Experiment in Four Secondary Schools," M. Uprichard (Ph.D. Thesis, London, 1947).

¹⁰ "A Study of the Efficiency of Individual Work," E. M. Thomson (*Br. Journ. Educ. Psych.*, Nov., 1932).

¹¹ The Research Department of the University of Birmingham Institute of Education is engaged on one such large scale team investigation in secondary modern schools—an investigation involving teachers, specialists in educational psychology and higher degree students.

¹² Summary of Researches Reported in Degree Theses (up to 1944). Part V, Teaching Method, pp. 93-100 (*Br. Journ. Educ. Psy.*, June, 1945). This survey covers experiments in teaching methods in subjects of both the primary and secondary school.

¹³ *Research and the Basic Curriculum*, C. M. Fleming (Univ., London Press, 1946). Fleming considers the relevance of the research findings to the teachings of the basic subjects and provides a very useful bibliography of research titles in relation to the school subjects considered.

research work, English and American, on reading, elementary mathematics, English, spelling, handwriting, history and geography. Research into teaching methods may be grouped under eight headings :

- (1) Experimental investigations of syllabuses for specific age groups (frequently insufficiently checked by objective measures).
- (2) An analysis of text books in relation to usage or demands.
- (3) Comparison of teaching methods.
- (4) The place and function of a subject in the curriculum for a particular age or age range.
- (5) Psychological analysis of a subject, with investigation of the fundamentals involved in various methods of teaching the subject including special aids such as films, concrete apparatus.
- (6) Modified or special methods of teaching subjects to particular pupils (e.g., handicapped pupils) or to pupils in a particular type of school (e.g., technical school or county college).
- (8) Remedial work with handicapped pupils (e.g., backward, part deaf or part blind pupils).
- (9) A historical survey of the teaching of particular subjects (e.g., mathematics and text books in mathematics, or the teaching of Latin).

All these branches of research into curricula, methods and text books have proved useful, provided that :

- (i) in investigations where specific experiments have been involved, there has been effective planning of the experiment and adequate statistical treatment of the results. An unnecessarily large amount of work in this field has been rendered valueless because of weakness in either or both of these directions.
- (ii) where historical or critical analyses or surveys are made they should be related closely to present-day educational trends and requirements.

More research into methods is required, excellent examples of which are the Scottish Research Council's investigations into methods of teaching in arithmetic¹ and reading.² Teachers need help and guidance from such research. Where it has been conclusively proved that one method is superior to another in clear cut objective fields of instruction, as for example in teaching subtraction in which the method of equal addition is superior to others, or where a form of setting out, as in division in the form $7/\overline{51}$, is advantageous for later stages in learning, then teachers should be given guidance from research results, and all schools encouraged to adopt such proven methods.³

¹ *Studies in Arithmetic*, Vols. I and II, Nos. XIII and XVIII, Scottish Council for Research in Education (Univ. London Press). *The Teaching of Arithmetic*, J. Morrison (S.C. for Res. in Educ., XXI).

² *Studies in Reading*, Vol. I, No. XXVI, S.C.R.E. (Univ. London Press).

³ Use of research results could do much to substantiate common sense procedures and fair dealing for pupils. Lately I have had four cases of pupils in junior schools much confused, because having just started to learn compound multiplication by commencing to multiply from the right, they have been transferred to a school where it is the practice to multiply from the left. But changes can occur even within the same school. In one form of boys in a grammar school there were pupils who had learned multiplication and division of decimals by one method in their junior schools only to change to standard form in the grammar school, and later, in the next year with a new master, to change back again to the first learnt method. Such kinds of teaching buffoonery might be eliminated if research results were used to produce much required uniformity in certain fields. And uniformity of teaching methods in the more objective subjects still enables teachers, in many other teaching situations, to try original and creative methods.

In fact an unduly large loss in efficiency and consequent backwardness is caused by use of confusing methods, and by lack of uniformity in methods from school to school in a given area. Similarly with methods of teaching reading¹ research has now shown, among other things, the value of starting early reading instruction by a sentence word-whole method, of the later value of phonic training and of the use of certain types of silent reading exercises in training in comprehension.

Those who are unaware of the value of investigations concerned with text books might consult such studies as those of Pullan,² Robson,³ and the Vernons.⁴ The last named research workers revealed how heavy are the vocabularies of some early reading texts. If those who compile reading books for young children made use of research results⁵ in regard to suitability of material at various ages, selection of vocabulary and its control, the spacing and arrangement of perceptual and meaning units, size of type, and form of illustrations, there would be much less disability in reading and more leisure reading done by children.

But the need for use of research results, and promotion of research, on text books is not confined to the primary school, for in spite of the fact that grammar schools deal with the more intelligent 15 to 20 per cent. of the pupil population, a certain amount of failure and frustration attends the learning efforts of some pupils in modern languages and in Latin where use is made of text books which have a heavy and non-functional vocabulary, and in which insufficient attention has been paid to grading of difficulties in relation to the pupils' learning powers. Similar difficulties arise in connection with mathematics text books. The conservatism of some teachers in respect to scientific findings about text books might be shaken by adequately planned experiments with different forms of pupils of similar ages and intelligence using text books of different teaching values.

Finally, reference should be made to two further aspects of teaching—learning experiments. Firstly, that research has revealed the extreme importance in the learning situation of emotional conditions.⁶ Secondly, that the pupil's background of experience is more important in respect to his success in learning than we had previously estimated. Neither of these far-reaching conditions of adequate teaching—learning situations has been sufficiently

¹ For a summary of some research findings applied to reading instruction, see *The Psychology and Teaching of Reading*, Chap. IV., F. J. Schonell (Oliver and Boyd).

² "School Text Books in Chemistry," J. M. Pullan (M.A. Thesis, 1932, Univ. London).

³ "The Vocabulary Burden in the First Year of French" (*Br. Journ. Ed. Psych.*, 1934).

⁴ "The Content of Infant Readers," P. E. and R. Vernon (unpublished report, Scot. C. Ed. Res., 1937).

⁵ Almost entirely American research. On vocabularies, see *The Teacher's Word Book*, Revised Edition, 1931 (Teachers' College, Columbia, New York). *A Reading Vocabulary for Primary Grades*, 1935, A. I. Gates (T.C., Columbia, New York). "A Basic Sight Vocabulary," (*El. Sch. Journ.*, Vol. 36 and 37, 1936). Two useful surveys relating to materials are given in 17th *Yearbook, The National Elementary Principal*, 1938 (Nat. Ed. Assoc., Washington, D.C.), and the 36th *Yearbook of the National Society for the Study of Education*, 1937. A good summary of American research results in relation to text books in reading is given in *How to Increase Reading Ability*, Chap. VIII, A. J. Harris (Longmans, 1940).

⁶ *The Young School Failure*, M. Highfield (Oliver and Boyd). Based on work in Leicester in which play therapy was used with backward pupils. A psychiatric social worker assisted in producing understanding contact between home and school in order to dissipate some of the emotional barriers that were preventing the children from learning.

"The Personal Relationship in Teaching," A. W. Hollis (M.A. Thesis, Univ. of Birmingham, 1934). See also for examples of the effect of emotional factors on learning, the various investigations concerned with the teaching of backward children.

widely recognized and incorporated into classroom practice. There is the need for more experimental work in relation to more pupils and more school subjects to discover in quantitative terms the effect of replacing negative emotional influences by positive ones, or of the value of augmented emotional stimuli to learning. Furthermore, although some teachers realize the difficulties of pupils in learning if new concepts, new information, new experiences, are framed in strange or unfamiliar settings, many still go on asking pupils to deal with symbols, or attempt the solution of problems, in quite strange settings unrelated to their everyday experiences. All this is of particular importance in the early stages of recognising the abstract symbols involved in learning reading and 'number,' but it applies equally strongly to many learning situations at later stages in secondary schools (particularly early work in geometry and trigonometry). Additional research could assist in this direction.

(Part IV will appear in the November number of this Journal and will conclude the series.)

SYMPOSIUM ON THE SELECTION OF PUPILS FOR DIFFERENT TYPES OF SECONDARY SCHOOLS.

IV.—AN EXPERIMENTER'S POINT OF VIEW.¹

By E. J. G. BRADFORD

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I.—*General considerations.* II.—*Qualities of a test battery for selection purposes.*
III.—*Substitution of group tests for individual tests.* IV.—*Constancy of bias.*
V.—*Relation of bias to general ability.* VI.—*Relation of bias to chronological age.*
VII.—*Emotional and temperamental influences.* VIII.—*Selection procedure
applied to an 11 plus sample.* IX.—*Summary and conclusions.* Appendices 1, 2.

I.—GENERAL CONSIDERATIONS.

SIR CYRIL BURT's very cogent survey of the difficulties; psychological, social and medical arising from the attempt to implement the policy of a differentiated education for post-primary pupils outlined in the Education Act of 1944, and Dr. Alexander's insistence upon the need to consider also, before their general application, the political implications of the possible alternative methods of selection, have between them probably exhausted the list of major guiding principles that must determine the general direction of research into the facets of the problem of selection.

The differences between the points of view expressed by the first two contributors to this symposium are hardly of a fundamental character. One difference may be described as temperamental, the other as statistical or experimental. Burt interprets the evidence accumulated up to date with great caution, and stresses his doubts regarding the possibility or even the wisdom of selection at 11 plus; while Alexander emphasises his hopes and beliefs that a satisfactory selection can be and should be made at that early age. The second difference of opinion relating to the size of the correlation coefficient to be expected between grammar and technical school tests, or the *gv* and *gF* tests, may be resolved by further testing or by different testing schemes.

The disagreement over the size of the correlation between hypothetical grammar and technical tests may be based, in part at least, upon a confusion of the various categories of significance. The correlation table focusses attention upon statistical and upon administrative aspects of the problem rather than upon psychological and educational aspects.

Two tests of general ability can be expected to give a high correlation, whereas ideal tests of *v* and of *F* might be expected to give a zero correlation. Tests with a high general factor saturation can be used for determining which pupils shall be offered an advanced education, but tests with a high and opposed bi-polar saturation should be chosen for differentiating the pupils who might be expected to profit most from a grammar course or from a technical course.

The concept of statistical significance is based upon the idea that a particular measurement (or a difference between two measurements) will only occur so many times in each sample of the population measured. The significance is irrelevant to the nature of that which is measured, and relevant only to the frequency of occurrence of measures of greater or less magnitude. A *psychological difference* may not always be reflected by a significant statistical difference, as when different

¹ This article incorporates the experimental results presented to the General Meeting of the B.P.S. in April, 1947. It had to be sent to the printer before the writer saw the third article in The Symposium by Mr. V. J. Moore in the February number of this *Journal*.

types of mental process are involved, for example, verbal or non-verbal thinking. The same applies to a difference which is educationally important.

Psychological differences can best be exposed by tests specifically designed for that purpose. The type of intelligence test commonly used for the selection of grammar school entrants is not so designed. The purpose of its sub-tests is to give the same or a confirmatory verdict and not a different one. Educational differences need to be confirmed by experiments designed to establish constancy over a period of time or by experiments designed to show how pupils of differing types of ability respond to alternative courses and to varied methods of instruction.

Hence, it would seem that the solution of the problem of selection must be sought by an experimental procedure designed (a) to develop tests or batteries of tests which differentiate psychologically (qualitatively as well as quantitatively); (b) to examine the constancy of the differences represented in the test scores; and (c) to compare the response of pupils of different types of ability to different courses and methods.

If the grammar and technical courses are to be regarded as *advanced* courses; i.e., courses adapted to the more rapidly developing intellects, then an intelligence battery, evenly balanced as between v and F saturations, should be used and its verdict treated independently of the tests intended to measure the v and F abilities. But since it is generally believed that the qualities of stability and persistence¹ are required, if full profit is to be obtained from an advanced course, even by the more intelligent pupil, tests of English and Arithmetic may well be included in the selection procedure. This is suggested not only because they can be used to ensure that a desired minimum in the command of the fundamental means of expression has been achieved, but also because success in the early stages of these school disciplines is some indication of the possession of temperamental qualities required for further study, or for profiting from expert teaching or coaching.

The intelligence test is accepted as a reasonably accurate and impartial instrument of selection, largely because there is evidence to show that the intelligence quotient remains fairly constant during the period of schooling. Hence, if tests for measuring differences in the type of ability are also to be accepted as accurate and impartial it will be necessary to show not only that such differences are large enough to be measured, but also that they are constant over a period of years.

Slater² considers that there is ample evidence that v can be measured at the age of eleven, but that evidence that spatial judgment, denoted by k can be measured at the age of eleven is insufficient. But according to Alexander "Drew seemed to establish that the F (practical) and the k (spatial) factor were independent, and further, confirmed that the F factor was capable of measurement at the age of 11 plus whereas the k factor did not appear to emerge until the age of 13 or later . . . Indeed; certain workers—notably Duncan—maintained that the F factor is capable of measurement as early as 9-10 years . . . *That evidence is the basis of my own view that measurement of technical ability is possible at eleven plus.*" (Present writer's italics.)

Neither Slater nor the writer can accept this evidence, but for different reasons. Slater's comments³ on Drew's presentation of his evidence is that "Unfortunately, the factor analyses on which Drew bases his conclusions do not fit the data obtained . . . this may be a consequence of the faults already mentioned in the design of the experiments, but there are certain findings which are

¹ Cf. A. WETHERILL: *Education*, Vol. XC., Dec., 1946; also M. ORMISTON, this *Journal*, Vol. IX, p. 222, and D. W. OATES, *Forum of Ed.*, Vol. VII, p. 185.

² *Occup. Psych.*, Vol. XXI, p. 137.

³ *Ibid.*, p. 139.

so extraordinary that one is forced to doubt whether they have been correctly recorded . . . for these reasons I have been unable to find anything of value in Drew's data."

The writer's difficulty in accepting Drew's conclusions at their face value arises, in the first place, from the fact that the performance testing of the two younger groups of pupils was largely carried out by Training College students hardly out of their 'teens and not by a responsible psychologist; and in the second place, the Passalong test was taken, quite arbitrarily, as the measure of F. Duncan also accepts the Passalong test as the measure of F. His experiment, which was educational rather than scientific, is really a valuable demonstration of the effect which a practical type of education may have in building up the self-respect of pupils whose inability to cope with the ordinary school curriculum would have led to the development of a sense of inferiority.

There appears to be a danger that the efforts to solve the problem of selection may become bogged in arguments about the measurement of factors and the psychological meaning (if any) of factors. Dr. Earle, trusting more to the psychological analysis of, and less to the statistical manipulation of, measurements of the work done in school comes to the conclusion that " Provided we take the trouble to study properly the mental processes involved, we need have no difficulty in making reliable forecasts at eleven plus regarding the probable progress and achievements of individual pupils and in basing our classifications upon them " ¹ and " I have been experimenting with tests which . . . might give useful information regarding the relevant strength of the different abilities employed by the child . . . and it seems very probable that the significance of these differences increases with age." ² Earle's view is then that the bias of ability shown at eleven plus is measurable, educationally significant and usually constant in direction. All three of these conclusions are supported by the experimental results I have obtained from a number of schools, which results are set out in the sequel.

In an earlier article ³ a distinction was made between the aims of a technical training and of training in craftsmanship for a particular trade, by stressing the notion that a technician differs from a craftsman in that he needs to have an understanding of the scientific processes which underlie the operations he is expected to control.

A trained technician should have his ingenuity harnessed to a knowledge of principles derived from the field of industrial or commercial experience, be it that of the draughtsman's office, the research laboratory, the production shop or the counting house. The relative importance of skills, of ingenuity, of insight and of principles demanded by the school may differ from that demanded by industry, but if a satisfactory selection procedure can be devised it should be adaptable to such modifications of the curriculum as may be necessary to meet the demands of an industry that is changing with the passage of time. The first step is surely the choosing of pupils who will best adapt themselves to the present type of secondary technical school curriculum. Can this be done and, if so, how? That is the essence of the educational problem set by the new Education Act.

II.—QUALITIES OF A TEST BATTERY FOR SELECTION PURPOSES.

A number of tests were given to pupils on entrance to a junior Technical School at 13 plus years of age. The scores obtained from these tests were

¹ *Occup. Psych.*, Vol. XXI, p. 195.

² *Occup. Psych.*, Vol. XXI, p. 197.

³ *This Journal*, Vol. XVI, p. 21.

compared with the examination marks obtained at the conclusion of the school course over two years later. The resulting correlations showed that two of the performance tests had more prognostic value than the others.¹ This correlation data was re-examined in the hope of gaining information relevant to these questions.

The tests, psychological and scholastic, were classified and grouped first into verbal and non-verbal batteries, and then re-grouped into two mixed batteries containing two verbal and two non-verbal tests in each. A common factor saturation was calculated from the correlations of each battery of four tests. The second step consisted of adding a fifth test to the battery, and of noting the amount of common factor which it shared with the other tests of the battery. Each added test, Machine Drawing, Workshop Practice, and the "K" test, was incorporated separately with each of the batteries. By this method it was possible to examine the relation of the peculiarly technical part of the school curriculum both to the tests and to the more theoretical part of the curriculum. The results are set out in Table I.

The most striking result of this treatment of the data was that a mixed battery, consisting of two scholastic tests and of two performance tests, produced a common factor which, whatever its psychological character, almost completely explained the correlations of the Drawing examination (90 per cent.), and a considerable proportion of the correlations of the Workshop Practice assessment (77 per cent.).

One result of this re-examination is the suggestion that a selection battery in which performance tests and scholastic tests are equally balanced might be devised for choosing pupils for a technical school. True, examinations in scientific and literary subjects are hardly suitable for candidates of eleven plus, but tests in Arithmetic and English could be substituted. A real difficulty arises from the fact that individual performance tests take too long, and perhaps lend themselves too readily to special coaching, so that some form of paper test will have to be substituted. The common factor saturations of the 'K' test suggest that this test is lacking in certain psychological characteristics represented by this composite battery. What are the psychological characteristics of this and of the other three batteries used in this examination of the technical school subjects?

TABLE I.

COMMON FACTOR SATURATIONS.

To show which combination of four tests gives the best indication of success in "technical" subjects.

<i>Non-verbal Battery.</i>					<i>Verbal Battery.</i>				
Kohs Blocks.....	71	75	83	74	Science	83	97	92	87
Cube Construction	74	74	80	72	Language	81	71	70	71
*Movearound	58	50	53	60	Problems	10	14	17	16
Form Board	59	47	50	58	Reading	33	24	28	22
<hr/>					<hr/>				
*Drawing	—	33	—	—	Drawing	—	55	—	—
Workshop	—	—	45	—	Workshop	—	—	39	—
"K" Test	—	—	—	63	"K" Test	—	—	—	00
<i>Mixed I. Battery.</i>					<i>Mixed II Battery.</i>				
Movearound	72	54	55	67	Science	73	73	61	52
Form Board	70	42	41	59	Kohs	52	50	57	68
Problems	25	24	27	17	Language	47	46	40	32
Reading	11	10	11	00	Cube Construction..	34	37	41	49
<hr/>					<hr/>				
Drawing	—	20	—	—	Drawing	—	90	—	—
Workshop	—	—	36	—	Workshop	—	—	77	—
"K" Test	—	—	—	45	"K" Test	—	—	—	50

¹ This *Journal*, Vol. XVI, p. 73, Table 4.

* This test is a modified form of the Passalong, see Appendix 1.

* Tests added singly to form a fifth member of the battery.

Introspection and the observation of the overt behaviour of those attempting the performance tests, supported by the evidence of changes in the saturations within the batteries brought about by the addition of the fifth test, justify tentative conclusions as to the psychological processes involved in the production of the correlations obtained from the tests and examinations. The assumption of 'g' as an element in all the common factor saturations will not explain the reversal of the gradients among the 'added' tests, e.g., non-verbal battery .33, .45, .63 and Verbal battery .55, .39, .00. Other influences must be sought.

The non-verbal battery presents the subject with samples of four types of new situations, which should call forth the subject's ingenuity or make demands upon his *flexibility of mind* (C.f. A. Meili uses the term Fluency for "the ease with which he can abandon and discard a certain idea" and "his mind is not 'glued' to ideas previously in consciousness"¹) in responding to an unsolved problem situation. The situations presented by the Drawing and the Workshop examinations have been made familiar by schooling and have been familiarised by habituation. Hence, it may be argued that the gradient in the general factor saturations from the Drawing to the 'K' test represents the diminution of the influence of flexibility of mind.

Success in the verbal battery reflects, I suggest, the effect of habituation resulting from schooling, and in particular habituation in the use of verbal and mathematical symbols, rather than of ingenuity or flexibility of mind. Such a hypothesis fits in with the complete reversal of the gradient among the 'added' variables. The saturation of the 'K' test with the common factor of the non-verbal battery was the highest (63 per cent.) whereas its saturation with the common factor of the verbal battery was lowest (00 per cent.). An alternative hypothesis to account for the reversal is that the non-verbal common factor includes what might be called spatial ability, which can be assumed to be unimportant in the common factor derived from the verbal group. The difficulty about this second hypothesis is to account for the high 'v' (?) saturation in the case of the Drawing test, or alternatively the very low 'g' (?) saturation in the case of the 'K' test.

The two performance tests which are included in the Mixed I battery are those which, according to observation, appear to make most demand upon ingenuity of the trial and error type, variation of response that is random rather than guided by principle or experience. (C.f. R. Cockett's conclusion "that a fundamental requirement in a performance test is that it must demand . . . continuous guidance of bodily action."²) These two tests account for most of the common factor in this battery, and the saturation which they show is most decreased by the addition of Drawing to the battery, and least by the addition of the 'K' test. From this it may be inferred that it is the importance of habituation in the response to Drawing situation rather than the non-verbal character of the Drawing test that places its saturation at the bottom of the gradient of saturations.

The two performance tests which form part of Mixed II battery can be responded to successfully by adopting either of two methods or a combination of both. A piece can be slowly revolved under observation until it can be *seen* to be a 'match' of the pattern or model to be copied, or alternatively the

¹ C. S. MYERS: "A new analysis of intelligence: A critical notice," *Occup. Psych.*, Vol. XXXI.

² *Brit. J. Psych.*, XXXVIII, p. 37.

pattern or model can be *imagined* as an arrangement of the blocks to be placed. The varied responses in the one case are guided by perception and in the other by imagination, in neither case is there much ingenuity of the random type. One of the results of schooling or of learning is to cut down dependence on random variation and to substitute guided variation.

The high saturations of Drawing and Workshop Practice suggest that the correlations obtained from these two school subjects reflect the influence not only of 'g,' but of two other influences which can best be described as Habituation—Ingenuity and Spatial—Verbal. The more a successful response depends upon habituation the less it depends on ingenuity; the more it depends on spatial arrangement the less it depends on the interpretation or manipulation of symbols (verbal). From this it may be deduced that *a group test which is to be substituted for the performance tests should incorporate the demand for guided variation of response; it should involve doing something which can be checked by observation, and the subject should be able to observe his own success or failure.* These features are not characteristic of most forms of non-verbal group tests.

III.—THE SUBSTITUTION OF GROUP TESTS FOR INDIVIDUAL TESTS.

One disadvantage of the more widely used non-verbal tests such as the Form Relations test of the N.I.I.P. and Slater's Squares test, is that although they demand of the subject the ability to imagine shapes, to fit or revolve shapes in imagination or to select shapes from perceptual data,¹ they do not really demand any constructive arrangements that can be checked by observation. Nor do they allow for the possibility of observing errors and correcting them, or for the possibility of the correction of an accumulation of unobserved errors under the stimulus of the emotional shock which such an accumulation can provide. (Emotionally maladjusted persons frequently fail at performance tests such as Cube Construction.)

To avoid these limitations of the non-verbal tests, a simple drawing test was devised.² It involved the copying of straight line patterns, using a graduated ruler. The drawing was carried out under fairly strict time limits. For the twelve-year-old pupils a demonstration of how to use a set square to draw a right-angle corner preceded the test. This 'Lattice' Drawing test, together with the greater part of Drew's composite 'K' test and the Kohs and Cube construction tests were combined to form a non-verbal battery. Four other tests combined to form a verbal battery were a Reading test, a Disarranged Sentences test, and two forms of Analogies test. These two forms, distinguished as Analogies Spatial and Analogies Verbal, differed in that the words incorporated in the former represented objects that could be 'imaged' (visual or kinaesthetic), the latter was made up of words of a more abstract nature which did not readily evoke appropriate images. Of this battery of eight tests half were expected to show a bi-polar saturation opposite to the other half. By this means it was hoped to show a bias of ability similar in direction and dimension to that obtained from individual tests such as Reading and Cube Construction.

¹ Compare the conclusion arrived at by M. D. Vernon (*Brit. J. Psych.*, XXXVIII, p. 88): "There were some indications, however, of two general factors influencing perception . . . Ability to perceive and discriminate pure shape and pattern characteristics. This appeared to be related to the brightness threshold, but not to intelligence or to λ -factor. The latter probably operates only when imaginal manipulation of the percept is required."

² See Appendix 2.

TABLE II.

SATURATION COEFFICIENTS OBTAINED FROM A COMPOSITE BATTERY OF GROUP AND INDIVIDUAL TESTS (BOYS, 12½ years).

	Common Factor.	Bi-polar Factor.
Analogies Verbal.....	49	45
Reading	44	57
Disarranged Sentences	00	54
Analogies Spatial	26	18
" K " Test	52	-22
Lattice Drawing	46	-49
Kohs Blocks.....	47	-45
Cube Construction	47	-55

TABLE III.

CHANGE IN COMMON FACTOR SATURATIONS PRODUCED BY CONTINUED ADDITION OF NON-VERBAL TESTS TO A VERBAL BATTERY. (BOYS, 12½ years).

	Verbal Battery.				Non-verbal Battery.
	Common Factor.	Common Factor 6 tests.	Common Factor 7 tests.	Common Factor 8 tests.	Common Factor
<i>Verbal.</i>					
Analogies Verbal.....	81	72	58	49	—
Reading	63	52	52	44	—
Disarranged Sentences	46	20	19	00	—
Analogies Spatial	29	40	30	26	—
<i>Non-Verbal.</i>					
Kohs Blocks.....	—	24	34	47	67
Cube Construction	—	17	30	47	78
" K " Test	—	—	44	52	49
Lattice Drawing	—	—	—	46	71

Table II presents among a number of interesting features some strictly relevant results, namely, the similarity of the saturations of the Lattice Drawing and of the Cube Construction tests, and the rather lower bi-polar saturation of the 'K' test which indicate that this drawing test is probably a better substitute for a performance test than is the 'K' test, though obviously both might with advantage be used in a battery designed for selection purposes. The group tested consisted of forty-eight boys who were 12 plus years old and were in the first year of a School Certificate course in an Intermediate School, but had failed to gain entrance to an ordinary grammar school. In other words they were of the intellectual calibre that will be offered advanced education when the Secondary Technical schools come into being.

Table III shows the need for caution in interpreting the common factor in psychological terms. It confirms the advisability of adjusting the balance

between verbal and non-verbal tests when attempting to measure 'general' ability. (This is but a re-statement of Burt's view that "the nature of each factor . . . depends upon . . . what is averaged.")¹ It also suggests that the 'K' test is not a good alternative to the type of performance test that is prognostically valuable in relation to technical ability.

The Drawing and Disarranged Sentence tests were next tried out on a complete entry (sixty boys and fifty-two girls) of grammar school pupils within the first fortnight of their arrival. A third test, Shipley's Abstractions, a Series test, was also given. The results taken in conjunction with those obtained from the boys of the school to which the results summarised in Tables II and III refer, indicate that the Drawing and Disarranged Sentences tests can be used as measures of the bias of ability shown by school pupils of this age and intellectual calibre. The mean correlation between Drawing and Disarranged Sentences (four groups) was $-.17$.

The indication is that for selected groups of pupils, values of r approximating to zero may be expected between verbal and practical tests. This conclusion is definitely relevant to the difference of opinion between Burt and Alexander.

TABLE IV.
CORRELATIONS OBTAINED FROM SELECTED GROUPS.

Grammar School Pupils. Age 12 years.							
60 Boys.				52 Girls.			
Drawing	Series	Sentences		Drawing	Series	Sentences	
Drawing	—	31	-.07	Drawing	—	11	-.13
Series	—	—	22	Series	—	—	-.05
Sentences	—	—	—	Sentences	—	—	—
Intermediate School Pupils. Age 12½ years.							
48 Boys.				32 Girls.			
Drawing	Analogies	Sentences		Drawing	Analogies	Sentences	
Drawing	—	.06	-.37	Drawing	—	.04	-.10
Analogies	—	—	18	Analogies	—	—	18
Sentences	—	—	—	Sentences	—	—	—

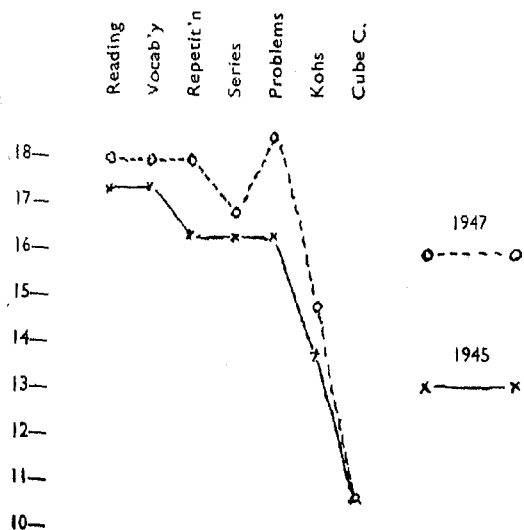
IV.—THE CONSTANCY OF INTELLECTUAL BIAS.

The scores of three of the nineteen pupils who were tested in the first year of a School Certificate course (a late entry at 13 plus) and again at the beginning of the fourth year are recorded graphically in units of mental age on page 75. The trend of the scores from the predominantly verbal to the predominantly practical tests tends to persist over the interval of nearly two years. This tendency can be expressed as the correlation coefficient between the mental age equivalents of the seven tests before and after the interval. If for the second series the mental age equivalents of each test be reduced by the average increase shown by the individual pupil, then the divergence between the first series of mental age estimates and the second series of 133 such estimates will be reflected in the size of the correlation between the two series, and the value of this r is $-.70$. Clearly there is a strong tendency for the original bias to persist.

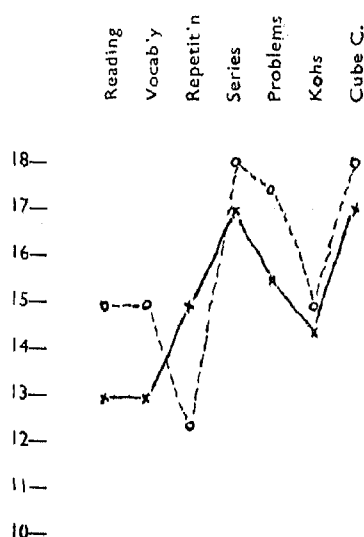
¹ This *Journal*, Vol. XIV, p. 94.

PSYCHOGRAPHS.
(Mental Age Units.)

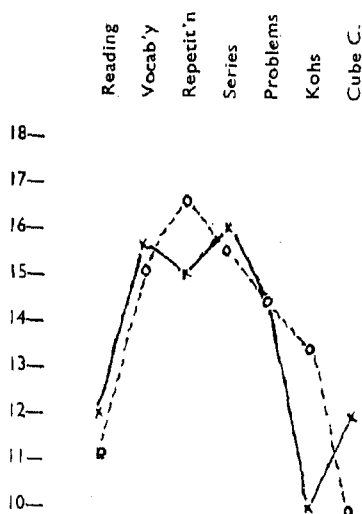
(a) Of three school pupils who were re-tested after an interval.
(b) Of two university students.



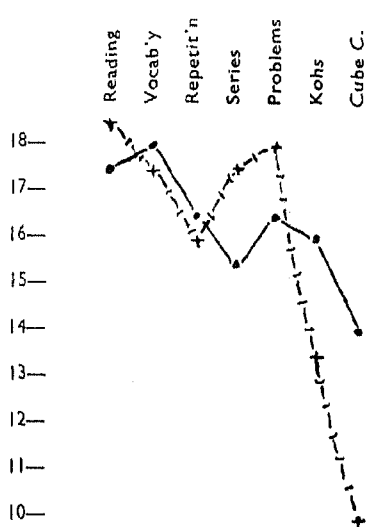
Failed examination at 11+
Tested at 14 and 16.



Failed examination at 11+
Tested at 14 and 16.



Failed examination at 11+
Tested at 14 and 16.



●—● Passed B.A. at second attempt. Maladjusted.
+—+ Undergraduate. Only child. Maladjusted.

An alternative and perhaps more informative presentation of the data is obtained by classifying the changes in direction of bias; taking the mean of the Reading and Vocabulary tests as the measure of verbal ability and the mean of the Kohs and Cube Construction test scores as the measure of practical ability. If the difference between the verbal and practical pairs of tests be measured in terms of the mean variation of those same tests calculated from the scores of the first and second application (less the mean improvement derived from all seven tests of the battery) these differences can be classified as below :

NUMBER OF PUPILS SHOWING BIAS OF DIFFERENT DIMENSIONS

	Less than $1\frac{1}{2}$ m.v.	$1\frac{1}{2}$ — $2\frac{1}{2}$	3—4	$4\frac{1}{2}$ — $5\frac{1}{2}$	6—7	$7\frac{1}{2}$ — $8\frac{1}{2}$	9—10	$10\frac{1}{2}$ — $11\frac{1}{2}$	12 or more
1st testing	7	7	1	2	0	0	0	0	2
2nd testing	10	5	2	1	0	0	0	0	2

Assuming that a bias equal to $1\frac{1}{2}$ m.v. is significant, then the constancy of the direction of the bias can be expressed as below. :

12 pupils exhibit significant constancy of direction (5 verbal, 2 practical, 5 negligible).

5 pupils exhibit a loss of their initial bias (4 verbal, 1 practical).

2 pupils exhibit a development of bias (1 verbal, 1 practical).

Although all these nineteen pupils were following a grammar school type, of course, five out of the original fourteen who showed a verbal bias have lost that bias during the interval. Any influence which such a course may have upon the development of a verbal bias has been overcome by the interests or the maturation plan, or both, of one-third of the pupils who started with a verbal bias. In only one case did a clear cut reversal of bias take place.

It is worthy of note that these changes took place not between the ages of 11 and 13, but between 14 and 16. The change may have been postponed by the nature of the curriculum, and might conceivably have been shown earlier if a more practical course had been followed between the ages of 10 and 12 years. Alternatively these results may be typical of the 14-16 age range. Should pupils only develop a practical bias after they find themselves in grammar schools they may well be directed towards advanced courses leading to degrees or diplomas in some branch of applied science or art, ranging from chemical engineering to physiotherapy. In such a case no harm need accrue to the intellectual development of the pupil. The case of the pupil who is directed to a technical course on the strength of a practical bias at the time of entry but who later develops a verbal bias, might be met by directing his attention to a career involving the writing up of practical activities rather than of their performance, as in a branch of scientific journalism.

Only a large scale investigation will enable us to estimate how many pupils can be expected to change in the direction of their intellectual bias. *A mere loss of bias cannot be regarded as unfitting a pupil for either type of course, technical or grammar.*

The view that changes of bias are personal (possibly innate) and rarely the product of environmental influences is also a conclusion arrived at by Earle.

"I am satisfied that the differences in the performance of individual pupils which emerge at 13, 14, or 15 are only occasionally produced by variations in school and home environment or by the influences of playmates, parents or teachers. I believe they are due much more frequently to the changes of emphasis which take place in the child's liking for, or interest in, the school activities of his group as he finds himself to be *and continuing to be* as successful as his fellows in some activities but less successful in others, or when he begins to consider the practical bearing which his school work, and his achievements therein, are likely to have upon his subsequent career. Loss of interest in a school activity is, in my experience, nearly always progressive, and is so

frequently associated with a felt inability to carry through easily and effectively the mental and physical processes essential to achievement . . . the one may be regarded as the symptom of the other."¹

Stated briefly, the child becomes interested in activities at which he is relatively more successful. If these can be discovered and catered for at 11 years, intellect and the self-respect born of success will develop hand in hand. The often remarkable progress of a technical school lad with an I.Q. between 100 and 105, comes from harnessing his skill in, and liking for, practical activities to an ambition associated with a practical career. If Primary school teachers could give more attention to the careful *grading* of the success of their pupils in the practical activities of the school it would direct the child's attention to his own abilities. A mark list for spelling or for sums is far more frequently met with on the classroom wall than is a mark list for the making of paper boxes.

V.—THE RELATION OF BIAS TO GENERAL ABILITY.

A sample of 145 boys drawn from four Secondary Modern schools were tested individually with a Reading test,² a Problems test,² and the Cube Construction test. They were all 13 plus years of age. They included among them all grades of ability except those whose Reading age was below 9 years, and those who had gained a place in the grammar or technical school. (The former were excluded because of their inability to read the Problems test.) The correlation between Reading and Problems was .34, between Problems and Cube Construction .32, and between Reading and Cube Construction .12. The difference between the mental age equivalent of the Reading and the Cube Construction scores was taken as the measure of the bias of ability, the Problems test was taken as the measure of general ability.

Table V shows that the size of the bias varies little as between the duller and the brighter pupils, except in the case of the 15-16 mental age group which has lost many members to the grammar schools.

TABLE V.
FREQUENCIES OF BIAS OF DIFFERING DIMENSIONS.

Problems test Mental Age.	9—10	11—12	13—14	15—16
Size of Bias in Mental Age years				
0—1½	9	17	16	16
2—3½	8	11	15	14
4 or more	10	13	10	6
Mean Bias in years	2½	2½	2½	2

Confirmatory results were obtained from the group of grammar school entrants who were given three group tests instead of three individual tests. These results are set out in Table VI.

TABLE VI.
RELATION OF BIAS OF ABILITY TO MENTAL AGE.

Mental Age in Shipley Abstractions.	Number of Pupils with a Difference of Rank in Drawing and Dis- arranged Sentences expressed as a fraction of the possible maximum difference.		
	Less than ¼.	Between ¼ and ½.	With ½ or more.
15 years and over	21 (26)	19 (18)	12 (11)
Under 15 years	27 (22)	17 (18)	16 (17)

Maximum difference of mark for 60 boys would be 59, and for 52 girls, 51. One-quarter of this range would be a difference of 15 in the case of boys and 13 in the case of girls.

¹ *Occup. Psych.*; Vol. XXI, p. 196.

² This *Journal*; Vol. XVI, p. 76—77.

The significance of these results is perhaps more forcibly expressed in educational units. If the entry of 112 pupils had been divided into four classes, A, B, C, D, on the basis of Drawing positions, and then reclassified into four classes on the strength of their success in the Disarranged Sentences test, 28 of the 112 pupils would have been two or more classes lower in one classification than in the other. Can such a difference of rank be considered as educationally significant? Most teachers would think so. Even for school subjects more closely related in 'g' saturation, such as Latin and Mathematics, grammar school teachers have found it advantageous to form as many as four 'sets' in each subject in order to meet the requirements of pupils in the same school year. It is interesting to note also that 12 out of the 28 with the most marked bias are in the group with the highest I.Q. (The Rank correlation between the Shipley test and the mean position derived from the ranks in all three tests is $R = .32$.)

If the ranks for the three tests be averaged and the pupils divided into an upper and a lower half, then the figures in brackets represent the distribution of bias in the two half groups. The practical suggestion arising from this is that if a battery of tests could be constructed on similar lines, then by choosing the candidates with the highest average rank as being suitable for some form of advanced education, those with a marked bias could be directed to the more suitable type of school, while those showing little bias could be offered a free choice of school. The degree of bias determining direction could be adjusted to the number of school places available. Such a scheme has the virtue of impartiality without being cumbersome, and with due consideration for domestic, social and medical factors its application appears to be feasible.

It should be remembered that if the selection for *advanced* education is the primary aim, and selection for *type* of education the secondary aim, then the pupils whose bias is to be measured are those with an I.Q. of, say, 110 and over. *The problem then becomes that of showing that pupils of C.A. 11 plus and a M.A. of 12½ years have or have not a bias of ability that is measurable.* Stated as "Can a selection at 12½ years be carried out?" a positive answer appears less improbable.

VI.—THE RELATION OF BIAS TO CHRONOLOGICAL AGE.

The evidence set out in section IV above indicated that there was little difference between the size of bias shown by the duller and that shown by the brighter pupils; hence the groups compared in this section though they differ in ability because of selection could still show a difference of size of bias due to age. Actually there is no suggestion of age affecting the range of bias among the groups compared.

The groups compared included two that were following a School Certificate course, one selected at 11 plus and tested at 12 plus, the other selected at 13 plus and tested at 14 plus, and a new group of age range 10 to 11 plus who had not yet faced the selection examination. All three groups had attempted among other tests, four in common, they were the Reading test and the Repetition test,¹ combined as the measure of verbal ability, and the Kohs and Cube Construction tests combined as the measure of practical ability. The Cube Construction test used with the younger group was a simpler modification of that used with the other groups; for this reason and for the fact that the testing was carried out by three undergraduate students of psychology under supervision, too great reliance should not be placed on the fairness of the comparison or the accuracy of the testing.

Each group was divided into three approximately equal sub-groups, those showing a verbal bias, those showing a practical bias and those with little or no

¹ *Brit. J. Med. Psych.*; Vol. XIV, p. 409. The test originally called Verbal Fluency Test.

bias. In each case the mean bias of the two biased sub-groups is equivalent to at least 2 years of mental age. A mental age difference of 2 years obtained from scholastic or intelligence tests is usually regarded as large enough to warrant teaching pupils in different classes; may not a similar difference of 2 years in bias also warrant teaching in different classes or even schools? Differentiation at 11 plus does appear to be possible.

MEAN MENTAL AGE EQUIVALENTS OF TEST SCORES.

Age group.	Pupils with Verbal bias.		Pupils with Practical bias.		Remainder of pupils.	
	Verbal tests.	Practical tests.	Verbal tests.	Practical tests.	Verbal tests.	Practical tests.
11 year	n (22) 13½	11	n (16) 11	13	n (23) 11½	11½
12½-year ...	(33) 14½	11½	(33) 12½	15	(38) 13½	13
14 year	(9) 15½	12	(7) 14	16	(15) 14½	14

VII.—EMOTIONAL AND TEMPERAMENTAL INFLUENCES.

A great deal of attention has been devoted to the unfortunate cases of pupils who fail to profit from advanced education after being successful at the selection examination. Much less is heard of the probably more numerous cases of those who fail at the selection examination for the same emotional or temperamental reasons. The selection examination weeds out many of those who might otherwise have been educational failures on grounds of morale rather than of intellect. No doubt four years of failure to reach a reasonable standard in a grammar or technical school may well be more damaging to the morale of the child than four years spent in a school where lower intellectual standards were demanded.

Relative weakness in the ability to succeed at performance tests is characteristic of many of the failures at the age of 11 plus (the records of two are shown elsewhere), and is even to be noted among university students who eventually gain a poor pass degree at the first or second attempt. Verbal bias may be an indication of emotional maladjustment. A selection battery devised to differentiate those who have a verbal bias from those who have a practical bias, if equally weighted on the verbal and non-verbal sides, will, therefore, tend to direct some maladjusted candidates¹ to the grammar school. Such a type of schooling might not be amiss provided the pupil was under the supervision of the child guidance clinic where appropriate therapy was available. An opposite type of failure at the 11 plus examination has in the past been met in the child who has developed considerable skill and interest in practical tasks at the expense of his or her literary development, e.g., a strong desire (scholastically unfortunate) to excel in piano playing or in ballet dancing, a desire sometimes backed by the drive of emotional tensions present in the home circle.

A gv battery of tests used as a selection instrument is likely to favour the chances of the neurotic child and diminish those of the child with practical interests. A gF battery would have the reverse effect. If the first requisite for acceptance for advanced education were a high *average* score on both gv and gF batteries combined, this would lead to the exclusion of some maladjusted children and to the acceptance of some children whose poor command of expression in the literary medium at present precludes them from gaining such an education. Children with an exceptionally marked bias, after due consideration of the school record card, might well be clinically examined before a final decision is made.

¹ Case 1 on p. 75 diagram (a) is the graphical record of one who was responding to psychotherapy which had been continuing for over two years, but whose intellectual bias still persisted.

What temperamental or behavioural characteristics are indicative of technical school success? If these could be clearly and confidently described then the teachers who fill up the school record cards could be helped to supply valuable evidence to those who share with them the responsibility for selection. Observations made upon the mode of response of technical school boys, while they were engaged in performance tests, showed that positive qualities such as a methodical attack, steady progress and careful checking were met with four times as frequently among those who obtained a good class of diploma as among those who failed entirely. Conversely in regard to qualities such as slowness and a tendency to ponder rather than to act; the failures had five times as many representatives proportionately to those who achieved a good diploma. The slap-dash boy who tends to act before he thinks is to be found almost as frequently among good and poor passes as among failures. It is highly probable that more systematic observations would yield more fruitful results; though it can hardly be expected that a boy's *mode* of response to a performance battery will be highly indicative of his future success in the mathematical and scientific portions of the technical course.

TABLE VII.
BEHAVIOUR CHARACTERISTICS NOTED DURING RESPONSE TO PERFORMANCE TESTS.

Number of pupils.	Class of Diploma.	Percentage who showed <i>unusually marked</i> .			
		Method and Carefulness	Hastiness in action.	Slowness in action.	Other adverse qualities.
94	1st or 2nd	17	10	3	22
90	3rd	6	10	12	25
53	Failure	4	14	16	33

The above table is a condensation of that given in this *Journal*; Vol. XVI, p. 76.

VIII.—SELECTION PROCEDURE APPLIED TO AN 11 PLUS SAMPLE.

The 11 year age group of a primary school were tested and classified with a view to discovering how the suggested principles for selection would work out when applied to an unselected school population of this age.

The criteria applied were (a) a minimum standard of scholastic attainment. Those in the lowest of the three classes were deemed to be below this standard; (b) those pupils who attained a score on the Shipley Abstractions which indicated that they might have a possible chance in competition were ranked; (c) the pupil with the highest average rank in three tests—Shipley Abstractions, Lattice Drawing, and Disarranged Sentences—should have priority of award for advanced education; (d) the pupil with a bias of less than one quarter of the maximum possible range should be offered a free choice of school, grammar or technical; (e) the pupil with a greater bias, if towards verbal ability should be offered only a grammar school place, if towards practical ability a technical school place.

The testing of the grammar school entrants showed that a score of 8 on the Shipley test was the approximate limit for pupils of 12 years of age. The minimum score for ranking the 11 plus boys was taken as 6. The grammar school sample suggested that there was a sex difference in the mean score in response to the test.

TABLE VIII.
THE EFFECT OF SELECTION UPON THE DISTRIBUTION OF SCORES IN THE SHIPLEY (SERIES)
TEST.

Shipley Test Score	0-3	4-5	6-7 ¹	8-9	10-11	12-13	14-16	Age.
Primary Lowest Class, Mixed	17	12	5	0	0	0	0	11 plus
Primary Top Class, Boys	8	7	7	8	5	5	0	11 plus
Primary Top Class, Girls	2	4	5	8	12	9	6	11 plus
Grammar Entrants, Boys	0	0	0	10	25	17	11	12 yrs.
Grammar Entrants, Girls ...	0	1	1	8	11	18	18	12 yrs.

TABLE IX.
THE EFFECT OF SEX (?) UPON THE DISTRIBUTION OF SCORES IN THE DRAWING TEST.

Drawing Test Score	0-3	4-5	6-7	8-9	10-11	12-13	14-16	Age.
Primary Top Class, Boys	13	9	5	5	4	1	3	11 plus
Primary Top Class, Girls	18	17	6	2	1	1	1	11 plus
Grammar Entrants, Boys	6	12	9	10	8	6	13	12 yrs.
Grammar Entrants, Girls	14	14	13	5	9	0	2	12 yrs.

TABLE X.
TWO STEPS IN SELECTION PROCEDURE.
(BOYS 11 PLUS.)

(1)
Rank order of pupils above the minimum standard in the Shipley Series test, and the bias of each pupil. (P.—practical. V—verbal.).

Shipley score.	Pupil.	Bias Rank Difference.
12	I	11 P
12	II	1 V
12	III	5 V
12	IV	2 V
12	V	7 V
11	VI	6 V
11	VII	6 V
10	VIII	4 V
10	IX	18 V
10	X	7 P
9	XI	0
9	XII	5 V
9	XIII	10 P
9	XIV	9 V
9	XV	15 P
8	XVI	11 P
8	XVII	4 P
8	XVIII	4 P
7	XIX	7 V
6	XX	0
6	XXI	17 P
6	XXII	14 V
6	XXIII	21 V
6	XXIV	1 P
6	XXV	19 P

(2)
Rank order of pupils based on mean position in three tests (Shipley, Drawing and Sentences) and their suggested allocation to schools.

Pupil.	Order based on 3 ranks.	School Allocation.
IV	1	Free choice.
V	2	Grammar.
I	3	Technical.
X	4	Technical.
VI	5	Grammar.
VII	6	Grammar.
VIII	7	Free choice.
XV	7	Technical.
III	9	Free choice.
XVIII	9	Free choice..
XII	11	Free choice.
XX	11	Free choice.
IX	13	Grammar.
XVI	14	Technical.
XVII	15	Free choice..
XXII	Reserve 1	Grammar.
XXIII	Reserve 2	Grammar.

¹ Equivalent to M.A. 12 years.

*Selection for Secondary Schools*TABLE XI.
(GIRLS, 11 PLUS.)

<i>Shipley score.</i>	<i>Pupil.</i>	<i>Bias Rank Difference.</i>	<i>Pupil.</i>	<i>Order based on 3 ranks.</i>	<i>School Allocation.</i>
16	I	1 V	I	1	Free choice.
14	II	2 V	III	2	Free choice.
14	III	1 V	VI	3	Free choice.
14	IV	3 P	II	4	Free choice.
14	V	17 V	IV	5	Free choice.
14	VI	2 V	XV	6	Free choice.
13	VII	6 V	V	7	Grammar.
13	VIII	6 P	XXX	8	Free choice.
13	IX	2 P	XIV	9	Free choice.
12	X	17 P	XVII	9	Grammar.
12	XI	7 P	XXXII	9	Free choice.
12	XII	1 P	VIII	12	Free choice.
12	XIII	4 P	X	13	Technical.
12	XIV	3 V	XXVIII	14	Grammar.
12	XV	3 P	XXXIII	15	Grammar.
11	XVI	3 P	XXI	16	Grammar.
11	XVII	10 V	XVIII	17	Technical.
11	XVIII	27 P	XXII	17	Free choice.
11	XIX	3 P	XX	19	Technical.
11	XX	35 P	XVI	20	Free choice.
11	XXI	27 V	XIX	20	Free choice.
11	XXII	2 P	IX	22	Free choice.
10	XXIII	8 V	VII	23	Free choice.
10	XXIV	22 V	XXIX	24	Free choice.
10	XXV	7 P	XXVII	25	Technical.
10	XXVI	18 V	XI	25	Free choice.
10	XXVII	23 P	XXIV	27	Grammar.
10	XXVIII	22 V			
9	XXIX	10 V			
9	XXX	8 P			
9	XXXI	11 P			
9	XXXII	0			
8	XXXIII	13 V			
8	XXXIV	6 V			
8	XXXV	2 P			
7	XXXVI	8 P			
7	XXXVII	18 P			
7	XXXVIII	8 V			

The age group consisted of 120 pupils, of whom eighty-seven were tested and sixty-three were up to the standard on the Shipley test required for final ranking with a view to allocation to schools. It was assumed that of the boys, twenty-five were competing for fifteen places, and thirty-eight girls for twenty-four places.

In Tables X and XI the pupils are ranked for Shipley score and for average rank on the three tests. The bias is expressed as difference between the rank obtained in the Drawing and the Sentences tests. On the assumption that all pupils who were allowed a free choice would claim a grammar school place, from the list of boys, ten of the first allocations would go to the grammar school, and the candidate placed fifteenth on the list would have to accept a technical school place, or alternatively the place would not be filled. If, however, three of the first six candidates who had a choice of school decided to claim a technical school place, then the fourteenth candidate would be passed over and the fifteenth candidate would be offered a grammar school place, so also would the 16th.

The merits of such a scheme are its impartiality and its flexibility. The size of the bias which is to determine the limit of freedom of choice can be adjusted in the light of experience gained from following up the school careers of the pupils, and in that way the educational significance of the bias can be determined. The scheme lends itself to the variation in the number of technical school places as between boys and girls; and to changes in consequence of the establishment of more technical schools.

IX.—SUMMARY AND CONCLUSIONS.

1.—Though no completely satisfactory proof of the existence, at the age of 11 years, of marked differences between success at verbal and practical tests may have been published, the results obtained from the group of primary school pupils reported in this paper suggest that measurable differences may be expected among pupils of 11 years of age, *if their mental age is at least 12 years*. More extensive research into this aspect of the problem is needed.

2.—Because self-respect tends to be linked with successful activity, the allocation of pupils to different types of secondary school or course should not be postponed until a pupil has had a long experience of comparative failure in certain school subjects. Revision of the initial allocation should be a regular routine procedure.

3.—The response made by children, when in a condition of emotional stress, to a test battery varies according to the composition of the battery. If it contains practical tasks, then the candidates for selection showing very marked verbal bias should as a precaution be interviewed by a psychologist before a final decision about allocation is made.

4.—Non-verbal group tests cannot safely be substituted for practical tests without previous investigations as to the nature of the demands which they make as compared to those made by a practical test.

A Drawing test has been devised which incorporates certain features of a practical task that are not represented in the better-known non-verbal tests. This test appears to work satisfactorily under group testing conditions.

5.—The type of selection procedure eventually to be adopted will have to be accepted as impartial in its decisions. A procedure that is *known* to be somewhat inaccurate is more likely to be accepted than one which is *suspected* of not being impartial. Hence if a start is made, as it must be, let it be admittedly experimental in the first place, and subject to revision, but it must be put forward as an attempt to provide an impartial decision.

6.—In the selection procedure the assessment of general or average ability should be made independently of the assessment of bias of ability towards the verbal or practical extremes. Tests measuring general ability must be highly correlated, tests measuring bias should be chosen as such only if they show a low correlation with one another.

7.—Under present-day school conditions girls, compared to boys of 11 plus, are handicapped by a restricted experience with rulers, and of drawing to exact measurements. Assuming that boys and girls are considered separately, a selection procedure might require :

- I. Tests of fundamentals in English and Arithmetic. Only those who reach the average standard in both tests to be considered for advanced education. Say, 40 per cent. of the candidates.

- II. A test battery equally balanced between verbal and non-verbal tests, the latter to include a practical test. The allocation to places in schools of advanced education to be made in order on the list for average position. This average to be calculated from three ranks, that on the list of tests with high 'g' saturation, that on the list for high 'v' saturation, and that on the list for high 'F' saturation.
- III. Candidates with a high average and no marked bias to be given priority of allocation and freedom of choice; biassed candidates with equally high average be given next priority but subject to direction to a grammar or technical school, with only the option of refusal.

In practice such a scheme would tend to allocate most of the more intelligent all-rounders to the grammar schools until, for one reason or another, the technical schools increased in popularity or public esteem. The general effect would be that the grammar schools would be filled first, and predominantly with all-rounders. Numbers of the verbally biassed would be squeezed out and have to complete their education in a Modern (or Commercial) school. The technical school would get fewer all-rounders and a number of practically biassed pupils with a lower average ability than those of the grammar school entry.

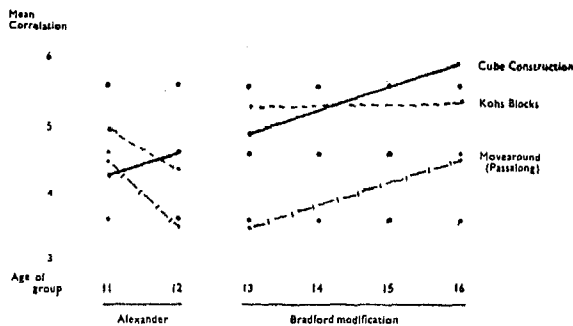
The danger of having separate examination papers for the different schools, grammar and technical, arises from the temptation which such an arrangement offers to both pupils and teachers to concentrate on the one that leads to the grammar school, and deliberately neglect the one that leads to the technical school. Cases have been known in which boys deliberately failed at the grammar school entrance test in order to be allowed to go to a technical school. Whether they were really suited to such a course by ability as well as by ambition one does not know.

The selection procedure must as far as possible disclose the type of ability of the candidate, and *this can only be done satisfactorily by compelling the candidate to give of his best in response to all types of test*. The risk of failing to gain a grammar school place by neglecting the 'F' section of the examination would be a sufficient spur to taking this section seriously, especially if it were known that the all-rounder had priority of allocation and freedom of choice.

APPENDIX I.

In a private communication Dr. Alexander writes: "The Passalong test as such is copyright and any results from the test which you have devised . . . should not be described as results obtained from the Passalong test." To meet his objection I have in this paper used the name Movearound for my modification. It is unfortunate that Drew in his tables referring to the 13 plus and 16 plus year groups has been misled into using the name Passalong for my modification of the test.

Modifications were also made in the Kohs and Cube Construction tests, hence it may be of interest to note the effects which the modifications may have had on the correlations between the tests. On the diagram below the mean correlation of each test with the other two is plotted against the age of the groups to which the two forms of test were given.



It should be noted that the 11 and 12-year groups differed, in that the latter were the residue after the grammar school pupils had been removed. The 13 and 16 groups were technical school boys who had been selected from a previous 12-year residue. The correlations are higher in spite of further selection.

APPENDIX 2.

THE 'LATTICE' RULER DRAWING TEST.¹

INSTRUCTIONS.

Diagram No. 1 shows how the pattern has been built up on a framework of squares.

Draw the frame *to the measurements given* and then the squares, complete the pattern if you have time.

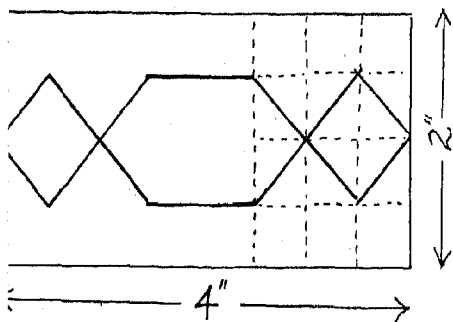
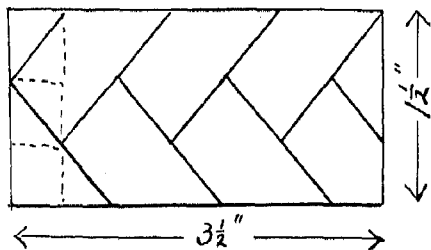
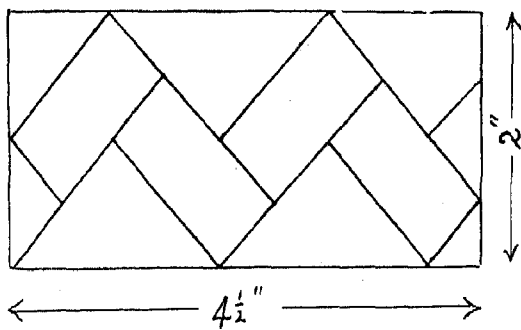
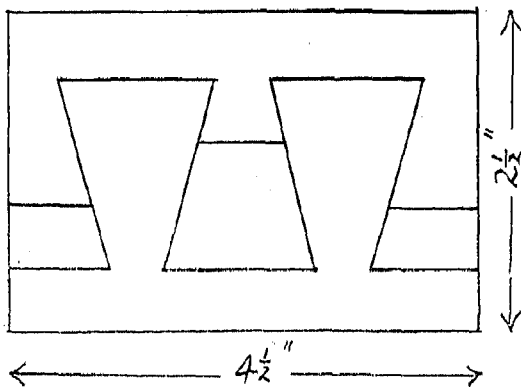
Patterns Nos. 2, 3, 4 can be drawn on similar frameworks of squares.

You *must start* a new pattern when told to do so,
Marks will be given for unfinished patterns.

If you finish a pattern before time, go straight on to the next one. Don't waste any time.

No marks must be made on the sheet of patterns.

¹ In its final form, this test owes a great deal to the valuable suggestions and criticisms of Mr. T. Wales, a teacher of Handicraft.

I*II**III**IV*

THE NEWSPAPER READING INTEREST OF ADOLESCENTS AND ADULTS.

By W. D. WALL.

(Lecturer in The Department of Education, University of Birmingham)

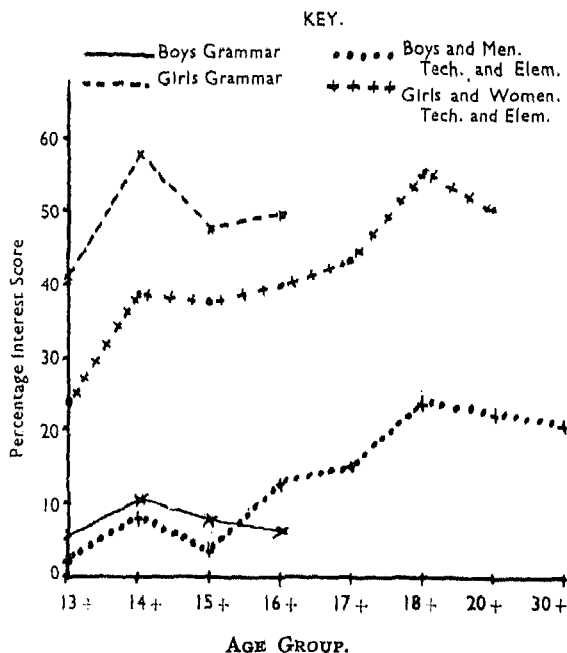
PART II.¹

VII.—Other features : (a) Gossip and domestic news ; (b) Leading article ; (c) Political feature article ; (d) Feature articles of general interest ; (e) Comic strip ; (f) Cartoon ; (g) Advertisements ; (h) Pictures ; (i) Sports news ; (j) Readers' letters ; (k) Military correspondent ; (l) Humorous paragraph ; (m) Miscellaneous items. VIII.—Discussion. IX.—Summary of conclusions.

VII.—OTHER FEATURES : (a) GOSSIP AND DOMESTIC NEWS (HOME PAGE, HOUSEHOLD HINTS, ETC.).

As we might expect on other grounds, the interest scores of boys and men on this item are very much lower than those of girls and women. The trends of the scores in all four groups appear to be similar—a rise from 13+ to 14+ and a slight fall again to 15+. Thereafter three of the groups show a slight rise, while among the grammar school boys the score falls again to 16+. Among the adult groups the rise continues to 18+ and is followed by a fall.

DIAGRAM NO. 2. GOSSIP AND DOMESTIC NEWS.



The motives for reading this section of the newspaper are made clear by those who put it first or second and as a consequence make a comment in answer

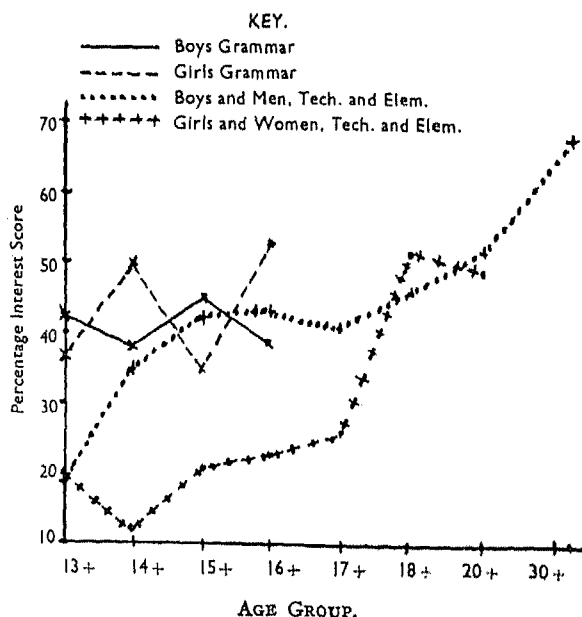
¹ For Part I, see this *Journal*, Vol. XVIII, Part I., Feb., 1948.

to Question 3. Among the girls the stress is upon trying out recipes, cookery hints, tips to help with house work and the like. "I read the house-hold hints," writes a girl of 14+¹ "to see if there is anything good to make"—a remark which is echoed in various ways by many others. Not a few are looking forward to the time when they have a home of their own; one young woman of 17+ writes: "Because as a future woman I think this item often gives helpful hints which will stand me in good stead in the future," and a grammar school girl of 16+ turns it more elegantly thus—"I am interested in this because, as I come to full maturity and a house of my own, they will be useful." Of the few men and boys who put this item as first or second choice, one (M.E. 20+) speaks of having his own home; another (M.E. 20+) of "keeping in touch with domestic and household affairs," and another (M.E. 30+) of "excellent ideas for post-war years." One non-grammar school boy of 14+ talks of "progress of future Building of Homes, etc.; also the advancements of domestic labour-saving devices."

(b) LEADING ARTICLE.

Diagram 3 shows a steady rise, with increasing age, of interest in matters of general, social and political interest in the groups with an elementary and technical school background. There are fluctuations in the scores made by the adolescent grammar school groups, but they seem to vary only between 35 and 53 per cent. In the groups of non-grammar school adolescents at 13+ interest appears to be at a very low level and to fall even lower with 14+ technical and elementary school girls. During the second half of the 'teens, however, and in

DIAGRAM NO. 3. LEADING ARTICLE.



¹ Here and throughout (E) stands for Technical and Elementary and (G) for Grammar School Groups. (M) or (F) refer to boys or men and girls or women, respectively. All comments are cited verbatim, preserving the spelling punctuation, etc., of the originals.

adulthood, the rise in interest is fairly steady, though noticeably greater among the boys whose interest at fifteen and sixteen equals that of their grammar school contemporaries. Between 17+ and 18+ there is a further rise, especially with the women which is coincident with entry into the services.

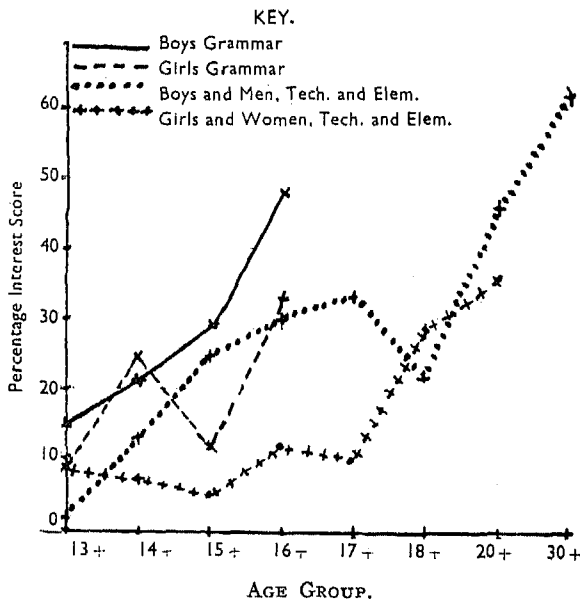
The trend, illustrated in Diagram 3, towards a greater interest among men than among women in more or less political opinion on current affairs (and the markedly closer approximation of girls of superior intelligence and education to boys and men than to the less able groups of like sex) is strikingly confirmed by a glance at Diagram No. 4 which deals with interest in *Political Feature Articles*. We can note here too the apparent effect upon the interests of women of entry into the services shown by the steep rise between 17+ and 18+ which continues with the twenties.

The function of the *Leading Article* in putting forth the opinion of the newspaper is recognized in all groups. "Much interesting information from it, views from above, generally interesting," writes a grammar school boy of 14+, whose first choice is *Current News*. "To see what thoughts people have," says another boy (E. 16+). "It is usually something to talk about," writes a woman of 20+ and a man of 30+, "it is generally the leading question of the day," and another of the same age—"Usually the most outspoken article in the paper." One boy of 14+ (E.) who proposes to read "Socialist Appeal," after the war, and now includes the *Daily Worker* and *Daily Herald* in his daily reading, says: "I read the leading articles in the newspapers to compare them."

(c) POLITICAL FEATURE ARTICLE.

In all groups in the early teens the interest in purely political writing seems to be low. From 13+ onwards, however, in the case of boys of both educational backgrounds, interest rises steeply and on the whole steadily.

DIAGRAM NO. 4. POLITICAL FEATURE ARTICLE.



The parallel courses of the two boys' groups suggest that the high level of interest reached by the 16+ grammar group might be the prelude to an even greater score for adults of this background.

As in the case of Leading Articles, the reasons given for reading this item are usually clear and unequivocal. "As I am now at the age when I can vote, I like to know who and what I am voting for," writes a woman of 21; and another: "Makes one interested in the Government of the country and how one likes to be ruled." "To make sure I use my vote to the best advantage," states a man of 20+; another of 30+ likes to know "What they are doing in Parliament" and another of the same age, "What the Government, particularly the Labour party, is doing." Many of the older men express an awareness of the way in which politics affects their intimate daily lives. "Because it is the lives of my wife, children and myself that are effected by politics," says one; and another: "Because to my mind politics has a great bearing on the causes and outcome of war."

Among adolescents the reasons given are more vague and general. "I want to know the political position in Germany and England now so as to understand what happens after the war," says a 14+ grammar school girl, and another of 16+ writes simply: "I am interested in politics." A grammar school boy of 16+ states "Purely interest in politics, especially party politics and foreign affairs," while a boy of 14+ from an elementary school says: "I am intrested in the political affairs of this country and have been intrested since the start of my father in this sphere."

(d) FEATURE ARTICLES OF GENERAL INTEREST.

In the kinds of daily journalism included under this head, there is perhaps more variety than in other items included in Question 2. Most of those, however, who put this item first or second on their list of preferences and who, in consequence, commented upon their interest in response to Question 3 seem to have grasped what was intended—those topical but non-political articles which provide a background to the events of the day. It appears from Table IV that in the grammar school groups interest in such matters is at a comparatively high level throughout the age-range studied. In the early teens interest is low among technical and elementary school pupils, but rises steadily at least until 17+ with no marked decline thereafter.

TABLE IV.
FEATURE ARTICLES OF GENERAL INTEREST.
(Percentage Interest Scores.)

	AGE GROUPS.							
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar Boys	46	51	69	56	—	—	—	—
Grammar Girls	66	71	63	75	—	—	—	—
Tech. and Elem. Boys and Men ..	23	44	44	56	59	54	58	58
Tech. and Elem. Girls and Women	26	21	34	34	41	62	56	—

The quality and intellectual appeal of feature articles varies from paper to paper and more especially from the popular national dailies to journals like

the *Manchester Guardian* or the *Times*. Nevertheless, a predisposition to attend to articles of this kind, no matter how lightly or how seriously written, is indicative of a broad curiosity about human affairs. This is well put by a grammar school boy of 15+ who claims to read the *Manchester Guardian* and who writes: "... usually topical, supplying me with knowledge I may not have and thus helping me to give a better judgment." More characteristic in all groups, however, is the vague; "Because they are interesting to read." A girl (G. 15+) writes: "I like to read any article no matter what it is about for many items of knowledge may be picked up in this way," another girl (G. 16+) speaks of variety of information; a young woman of 17+ who reads three dailies says: "I like to know what is going on in Great Britain concerning Housing, Schooling, etc."; and a woman of 21 remarks that "You never know what you may come across, the articles have different 'flavours' and help to educate you generally." A boy of 14+ (E.) speaks of discussing such features with his friends; and a grammar school boy of the same age likes "to read anything interesting about which I know little"; another speaks of keeping abreast with "the latest developments in science, medical science, etc." A few seem partially to have misunderstood what was meant; for example, the man of 22 who from the rest of his answers appears to confine all his reading to the *Daily Mirror* and who writes "Because sometimes there are some very interesting articles. It may be a murder case which last a couple of weeks or anything of that sort." A boy (14+ E.) seems entirely to have mistaken the intention of the item since he writes: "I sometimes know the people who have been prosecuted or honoured."

(e) COMIC STRIPS.

The *Comic Strip* is much less a feature of English than it is of American daily and weekly journalism, but there are few popular dailies which do not have at least one strip detailing in from four to six black and white pictures, with a minimum of explanatory reading matter, the adventures of one or two characters. Sometimes each strip is complete in itself though the character or characters persist from day to day. Equally often the daily strip is an instalment of a narrative which may last over a matter of weeks.¹

¹ The term 'Comic Strip' is in a sense misleading, though it is the one commonly in use, for very many of the strips are not in the strict sense 'comic' at all. They may concern the hair-raising adventures of a detective, the doings of a superman in the secret service or an invasion from Mars. Not a few of them have a topical flavour and concern such things as house hunting or black market activities. Some are frankly escapist and deal with life in the past—more or less remote—or in the chromium age just round the next millenium. Many of them, are, however, humorous or comic, and deal with the day-to-day dilemmas of more or less ordinary people—adolescent calf love, happenings at the office, social gaffes and the like. Some exploit the appeal of stupidity and misunderstanding. Not a few are based upon well-known film characters, or grotesques.

On the fringe of this type of strip are those which aim to convey information of one kind or another—exploiting the desire to know about the "fastest"—"the largest"—"the strangest"—in fact, all the superlatives of curiosity. In at least one recent instance, a series purporting to give the psychological interpretation of different kinds of dreams drew a protest from members of the British Psychological Society.

There are, of course, weekly, fortnightly and monthly sheets, booklets and magazines published in this country, and still more in the United States, consisting solely of such strips but, although they belong to the genre, we are not concerned with them here. Hill and Trent ("Children's Interest in Comic Strips" *Journ. Ed. Research*, Sept., 1940) state that over 1,200 comic strips are published in America in addition to those appearing in the daily newspapers. Comic strip versions of *Gulliver's Travels*, *Treasure Island*, *Black Beauty*, and other classics have appeared from time to time either in children's comics or as independent publications. Some of the latter are printed in a size small enough to be concealed readily under a school desk.

Of the newspapers mentioned by the subjects of this study, one stands out, however, for the amount of space allotted to comic strips even in the times of greatest paper shortage. Throughout the war, the *Daily Mirror* carried one page entirely devoted to strips. In addition, there were usually three other strips occupying the top or bottom of three other pages, as well as illustrated jokes elsewhere. One of these strips—the adventures of “Jane”—has become sufficiently famous to be the parent of a revue, and of two or three independent publications available on railway bookstalls.¹ It sets forth the adventures of a high-spirited young lady and her daschund ‘Dio.’ At the time of this survey it dealt with her adventures as part of an E.N.S.A. show, her attempts to get jobs, her encounters with designing employers and others, her love affairs and dilemmas. She was frequently to be seen in poses which, though unconventional, were rarely inelegant and very often was depicted in the scantiest of negligé. The appeal of this strip, especially to the adolescent boy and girl, is difficult to analyse. Undoubtedly the ease with which the eye scans and the mind follows the daily adventures is one factor as it is with most strips. But there is more than this, more even than the erotic appeal of the, at times, perhaps slightly suggestive drawing or situation. The adventures of Jane though exaggerated are conceivable and topical and the characters who come and go from week to week, sufficiently schematic to be easily identified with real or imaginary persons in the reader’s environment. Socially Jane moves in a sphere a little, but not too far, above that of most of her readers; daily cares do not vex her and troubles of clothes and food rationing do not arise; but she is conventionally moral, reasonably (but not too) intelligent, physically attractive, gay and young. She offers an ideal of a sort not too far removed from possibility for adolescent boys and young men some of whom (only half facetiously) state their ambition to be Jane’s husband² and an object of fantasy identification for adolescent girls and young women.

One strip has been dealt with at some length because it is in many ways an example of others. It should be recalled too that illustrated papers, of which the *Daily Mirror* is the chief, and in many groups the sole example, form rather more than a third of the newspaper reading of the adult women of the present sample and nearly a third of that of the men, while substantial proportions of adolescents from elementary and technical school backgrounds read it and very little else.³ The comic strip page is not infrequently given as a reason for choosing the *Daily Mirror* as the newspaper to be read after the war—in the words of one boy, “there is a piece in it called Jane and she often goes about quite naked and that is very good.”

The reasons given by the subjects themselves for placing comic strips in the first or second place in their list fall readily into clearly defined categories. Some stress the motive of escape. “Why I read the comic strip is because it makes you laugh and is a change from the war news” is the reply of a boy (E. 15+) echoed by many others, both boys and girls of a similar background, notably the boy of 13+ (E.) who puts the strip second to current news and says that “it takes my mind off the flying bombs in London.” Equally characteristic and probably springing from much the same motive are replies such as

¹ Miss M. I. Dunsdon informed the writer of the case of a boy of 16+ who stole copies of the *Daily Mirror* because his older mates at work would pay 2d. or 3d. a copy for it, just to have ‘Jane.’

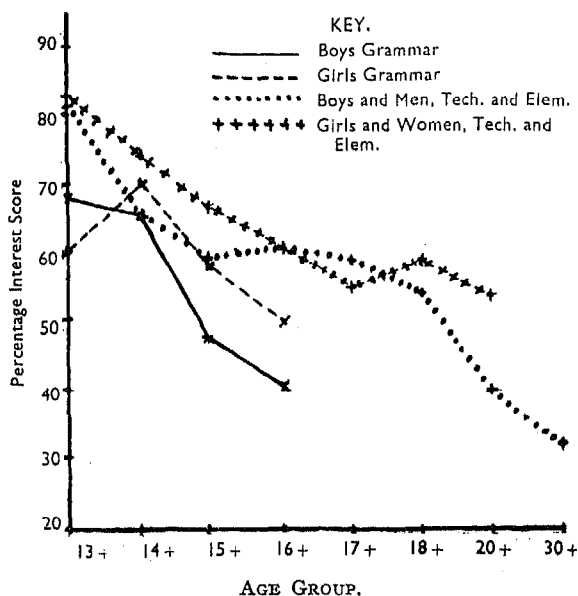
² Vide material from other sources cited in the present writer’s *Adolescent Child*, Chapter IV (Methuen).

³ See Part I, Table I. There is reason to believe, as was stated earlier, that the figures for adolescents of this sample are considerably lower than would be derived from a sample living in the South-East and South-West of England.

"they are joyful" (M.E. 13+), or "because I am normal and have a sense of humour" (M.G. 15+) or "they are very funny" (F.E. 14+) or "Comic strips help to keep one's moral up." (F.E. 14+). Narrative interest and suspense are mentioned and remarks like the following are common—"because they are serials and often very interesting (F.E. 14+); "they are very exiting and continuous and I look forward to read them" (M.E. 13+). Not a few enumerate characters as does the thirteen year old (M.E.) who writes: "I like to see the adventures of Garth, Buck Ryan, Blendia,¹ Ruggles, Jane and Popeye."

We approach more nearly to one of the fundamental motives for liking the strips—and probably illustrated papers generally—in another group of replies which emphasise the ease with which they can be assimilated. "I am a person that enjoys reading about people's adventures in pictures, e.g., the *Daily Mirror*," writes a youth of 17+ (E.); and a woman of 20+ says: "I suppose its because I like the lighter side of reading really, that includes the pictures which explains most easily." A man of 30+ puts it thus: "Because of Eye strain. Can't read small print"—his first three choices are *Comic Strips*, *Cartoons* and *Pictures* and his daily, the *Mirror*—and a grammar school boy of 14+ whose choice of books is singularly juvenile states more bluntly still—"because they have not to be read."

DIAGRAM NO. 5. COMIC STRIP.



¹ He means "Belinda Blueeyes" a child curiously reminiscent of Shirley Temple, the juvenile film star, who at this time was going through a series of adventures and sufferings while separated from her father. "Garth" is a man of great physical strength whose adventures were set in various rather vague, historical periods. "Buck Ryan" was having hair-raising encounters with crooks, enemy agents and the like. "Ruggles" is middle-aged, unworldly wisdom personified—the father of a family, spending his time helping others, usually, becoming involved in their troubles. "Popeye" is a character from the animated film cartoons—a grotesque sailor who owes his strength to spinach and who encounters a series of fantastic adventures. He is more like the caricatures of the older strip magazines like *Comic Cuts*. All the characters mentioned in this answer were (and still are) to be found in the comic strips of the *Daily Mirror*.

In the light of these comments from the answer sheets, Diagram No. 5 is revealing. It will be seen that at the age of 13+ interest in comic strips stands high in all four sex and educational groups, very high in those groups from the elementary and technical schools. Thereafter in all groups with the passing exceptions of grammar girls at 14+ and technical and elementary boys at 16+, the decline in interest is rapid, though, even in the late 'teens, it stands high with young men and women of an elementary and technical school background. Interest among girls seems slightly higher than among boys, and among non-grammar school than among grammar school groups. A preponderant interest in *Comic Strips* would seem to be a sign of immaturity.¹

(f) CARTOONS.

Interest in the daily cartoon as will be seen from Table V seems to follow, though not so markedly, much the same course as that in *Comic Strips*. Throughout the age range studied and in all groups with some fluctuations (notably grammar girls from 13+ to 14+ where the rise is similar to that seen in Diagram 5) there is a decline in the interest scores.

TABLE V.
CARTOONS.
(Percentage Interest Scores.)

	AGE GROUP.							
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	73	74	63	47	—	—	—	—
Grammar, Girls	65	82	68	59	—	—	—	—
Tech. and Elem., Boys and Men ..	81	62	67	58	65	52	49	46
Tech. and Elem., Girls and Women.	81	73	60	53	53	59	55	—

In some ways this is puzzling since it would be thought that the content of most cartoons is sufficiently different from that of comic strips to make the

¹ Evidence of indirect relevance to the present problem is given by Eisenberg and by Witty, both of whom studied the interest shown by American children in Comic Strips, though their data refers mainly to the strip magazines rather than to the single strips or pages of strips published in the newspapers.

Eisenberg (*Children and Radio Programmes*, Columbia Univ. Press, 1936, cited by Hill and Trent, *loc. cit.*) concluded that "reading the funnies is preferred by (American) children to listening to the radio; and Witty ("Children's Interest in Reading the Comics" *Journ. Ed. Research*, Vol. X, No. 3, Dec., 1941) found that "looking at the Sunday funny paper" was a play activity in which boys and girls of 8 to 15 engaged most frequently. He found, however, that there was little difference in the number of strips read by boys and girls and no truly significant differences either in the type or amount of such reading from grade to grade. In a second study in the same *Journal* ("Reading the Comics—a Comparative Study") Witty reports "no difference in intelligence, patterns of general reading, or adjustment between the 10 per cent. reading most and the 10 per cent. reading fewest comics in his group. It should be remembered that the data in the text show the importance, in the eyes of the subjects, of the Comic Strip relative to other sections of the newspapers, i.e., difference in emphasis in reading interest rather than differences in quantity read. Other researches have shown (e.g., Terman and Lima, *Children's Reading*; Jenkinson, *What do Boys and Girls Read*) that able children read more of all kinds of things, good and bad, than do duller, and that the relative importance of different kinds of reading matter is more significant than differences in quantity of this or that kind of literature read.

basis of appeal of the two things very unlike. Whereas the comic strip is escapist, narrative and as a rule only indirectly topical, the cartoon is often satirical or humorous comment upon events in the domestic or international political sphere. In common, of course, they have directness of visual presentation, a quality of simplification or caricature in their treatment of human beings and, if not always a humorous intention in the case of cartoons, a presentation of their matter in a humorous way.

Many of the replies given do not indicate an appreciation of the underlying purpose of the cartoons in most dailies. Replies like that of the boy of 13+ (G.) who says: "I like to see the impression the artist gives of the topical news," or that of the girl (13+E.) who writes: "The Cartoonist shows what happens daily in our life" are not common. More frequent are references to "a good laugh" (F.E. 14+); or "only take a second to look at and are usually funny" (M.G. 16+), or "Cartoons help to give you a happy look on the war" (M.E. 14+). A number, particularly of adolescents interestingly enough, adduce motives like "I am interested in scetching and cartoons" (F.E. 14+); "I am interested in art, and particularly cartoons" (F.G. 16+), or "I try to draw the cartoons" (M.E. 13+).¹

We can legitimately conclude from this rather scanty evidence that, to most adolescents, at all events, the appeal of the cartoon is similar to that of the comic strip; it is amusing, easy to grasp—though not necessarily to understand fully—and makes no great demand upon literacy or attention. There is very little evidence to suggest that the more subtle purpose of the cartoonist is thoroughly understood and appreciated by more than a few.

(g) ADVERTISEMENTS.

The restrictions on newsprint during the war (and now), as well as the lack of goods for sale, considerably diminished the space devoted to advertising in the press at the time of this survey. Nor was the motive of job-seeking a strong one because of the war-time shortage of manpower, the Essential Works Orders, and the fact that almost all the adults were in the services.

Replies are found like that of the girl (E. 14+) who writes: "I always read the Advertisements in case I am ever out of work. I will know a few firms to try and find employment." But they are not common and are confined to the 14+ age group of elementary and technical school girls. More usual are references either vague or specific to things for sale. "I am interested in Animals and musical instruments and like to see just what is advertised," writes a grammar school girl of 13+, and a 17+ girl (E.) says: "Sometimes a friend may ask you if it is possible for you to obtain a certain thing for her and in this article you may come across it." Fashions are a source of interest to the girls—"I look at the advertisements to see the new kind of fashions and the prices of them" (F.E. 17+) or "I am a fashion lover" (F.E. 16+).

When we come to the comparatively few replies from the adult groups we find that advertisements are read more as pointers to other conditions than for themselves. For examples, a woman of 21 writes: "I like to find out what people are really short of—houses, etc., or daily and weekly help"; a man of 25 says that he reads the advertisements "to see how the motor trade is progressing and to keep in contact with the various price lists throughout

¹ Witty (*loc. cit.*) found that 60 per cent. of his groups claimed to like drawing comic strips. No subject of this survey spontaneously stated this but replies like those cited above are not at all uncommon among boys and girls who put 'cartoons' as their first or second choice.

London Areas, etc.," and a man of 31—"Interested in the advertising business and methods of showing public what an asset advertising is in commercial life."

From Table VI it will be seen that interest in newspaper advertisements on the whole and at all ages is higher among women and girls than among boys and men, but only among girls from elementary and technical schools does it hold even a moderately high level.¹

TABLE VI.
ADVERTISEMENTS.
(Percentage Interest Scores).

AGE GROUPS.								
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	29	32	31	26	—	—	—	—
Grammar, Girls	37	41	44	34	—	—	—	—
Tech. and Elem., Boys and Men ..	34	36	28	23	26	28	28	29
Tech. and Elem., Girls and Women.	53	59	57	53	33	42	28	—

(h) PICTURES.

Although the preliminary tryout of the questionnaire gave no indication that it might be so, this item apparently was ambiguous. A number of adolescents in both educational groups understood this to mean not the photographs which most newspapers carried even during the war, but advertisements and criticisms of films. This renders the figures especially for the elementary and technical 13+—15+ boys and girls somewhat suspect, though probably not so much those for the grammar school and adult groups. It is, however, of interest to notice from Table VII that the trends of interest in the 'teens shown by all the four adolescent groups are similar, which is contrary to what might be expected had misunderstanding of the item been widespread in any one group.

TABLE VII.
PICTURES.
(Percentage Interest Scores.)

AGE GROUPS.								
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	63	60	58	59	—	—	—	—
Grammar, Girls	63	71	70	58	—	—	—	—
Tech. and Elem., Boys and Men ...	61	55	56	61	62	63	48	56
Tech. and Elem., Girls and Women	72	73	78	62	54	63	57	—

¹ Among other criteria of maturity empirically deduced by Weitzman from administering a multiple choice questionnaire to 899 subjects between the ages of 16 and 24, is "Rarely answers newspaper, catalogue or radio advertisements." ("A Study of Social Maturity in Persons Sixteen through Twenty-four years of age," *Journ. Gen. Psych.*, Vol. 64, Pt. I, 1944.)

Of those who understood the question properly a number refer to the ease with which information can be assimilated through pictures—"Appeal to the eye—easy to assimilate," writes a man of 32; "to save reading" says a girl (E.14+); a young woman of 17+ "Because, by looking at the pictures I get an idea of the news and sometimes I haven't time to read anything"; and a boy (16+ G.) says categorically, "Pictures are the best way to convey news." The actuality of the photographs is mentioned by others. One girl (13+ G.) writes very fully "Pictures always show scenes in life more clearly than words. They stimulate the imagination and if they are war pictures they help one to see the conditions of the war"; and a woman of 21 says: "Pictures show exactly what is happening." Others mention habit, and the fact that the pictures in a newspaper are the first to catch the eye. Many, especially among the boys, refer to war pictures and pictures of weapons as of major interest to them. Some few speak of cutting out and keeping particularly interesting pictures.

(i) SPORTS NEWS.

Sports News reaches a high level of interest among boys and men at all ages and is of comparatively minor importance, to girls and women. The answers given by those who put Sports News in first or second place are closely similar, e.g.: "I am very interested in sport" (F.E. 16+); "Always interested me from boyhood" (M.E. 30+); "Sport is my biggest hobby" (M.E. 18+); "I

TABLE VIII.

SPORTS NEWS.

(Percentage Interest Scores.)

AGE GROUPS.								
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	64	66	70	64	—	—	—	—
Grammar, Girls	50	58	35	41	—	—	—	—
Tech. and Elem.; Boys and Men ..	66	59	53	59	65	74	75	70
Tech. and Elem., Girls and Women.	38	26	32	28	12	41	24	—

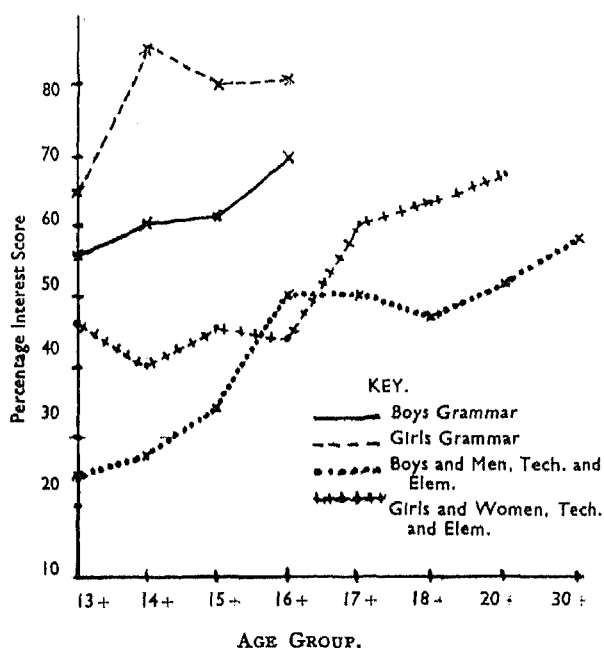
choose it to find if my favourite football team has won" (M.E. 14+); and one boy (14+G) writes: "Sports because school is a waste of time and I am naturally athletic." Other boys and men mention specific interests in particular sports, and ambitions "to enter the world of sport" (M.E. 18+); or to "become a Gym. Instructor" (M.G. 15+). There are, too, particularly among the men, mentions of greyhound racing, football pool coupons, and sweepstakes. Not a few of the older men write in the nostalgic strain of one who says: "Because it is about the only sanest thing left." (M.E. 30+.)

(j) READERS' LETTERS.

From the remarks of those who put this part of the newspaper first or second, interest in letters written to the paper seems to spring largely from an inquisitiveness about people generally and their views on current topics. One or two subjects mention learning things from the letters of other people, but script after script emphasizes the interest of knowing "What other people think about

different things, if my opinion is that of most people, and if not, why not" (F.G. 16+); or, as a young woman of 17+ says: "In this part of the paper people express their own opinion and that is the most important use of a paper so that we are united in this way and know what other people think." There is emphasis on the "human aspect" (M.E. 20+); upon "how some people are getting treated" (M.E. 18+); on "the general feeling of working-class people" (M.E. 18+); "complaints against the Corporation" (M.E. 16+); on "what the people want done" (F.E. 13+); on "the grumblings also the betterment of the town's future" (F.E. 15+). All these and many more suggest that reading letters to the press is a way of getting a sense of solidarity with one's kind, and at the same time of vicariously enjoying the opportunity to air a grievance. It is not fanciful to see in an increasing interest of this sort a sign of growing social intelligence.

DIAGRAM NO. 6. READERS' LETTERS.



The greater maturity of the grammar school groups is (it seems from Diagram 6) more manifest in this than in any other field. Moreover the generally greater maturity of adolescent girls than of adolescent boys of similar ability and background in the early teens is also fairly clearly shewn.

(h) MILITARY CORRESPONDENTS.

From Table IX it will be seen that in most groups, except the girls from elementary and technical schools, interest in the reporting of the *Military Correspondents* of the various papers was moderately high though not perhaps as high as one might have expected from the figures for *Current News of the War* (Diagram 1). The steep rise between 17+ and 18+ in the case of young women corresponds to the similar increases at the same age in interest in *Leading*

Articles (No. 3) and *Political Feature Articles* (No. 2). Since the 18+ group was composed entirely of young service women in their first year of A.T.S. life it looks as though a deeper involvement in the war, and its personal consequences, had sharpened their interest in the war itself from an individual standpoint and in the political issues raised by it.

TABLE IX.
MILITARY CORRESPONDENTS.
(Percentage Interest Scores.)

	AGE GROUP.							
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	37	35	61	46	—	—	—	—
Grammar, Girls	42	45	38	52	—	—	—	—
Tech. and Elem., Boys and Men ..	35	39	46	54	59	44	47	37
Tech. and Elem., Girls and Women.	19	17	15	28	17	44	43	—

The reasons given for putting it first or second choice suggest that the interest of adolescent girls and women of all ages in the reporting of the military correspondents springs from the intimate details of the war in its human aspects which are given in their writings. Frequent mentions are made of "the little things which happen when troops enter a town" (F.G. 14+); of the fact that these correspondents are "with our men and relatives and can express their views" (F.G. 15+); of "the conditions in which our men are fighting" (F.E. 15+). "You usually get the facts from the radio but not enough story to them—Military Correspondents give you the inside of the war news" writes one woman (20+) with considerable insight.

Among the boys and men the interest seems to be on the whole more impersonal. "I find it interesting to look into the battles which are being conducted and to realise that each attack is part of an extensive plan," writes a young man of 17+; and another (M.E. 16+) speaks of his interest in "the way the army is run and tactics and strategy of the war." Some speak of the interest of first-hand accounts of events which "give you ideas what it is to be at the war fronts." (M.E. 14+).

(I) HUMOROUS PARAGRAPH.

Surprisingly few in any of the adult groups put this item as their first or second choice; on the other hand no large proportions except of men of 30+ crossed it out to indicate that it had no interest at all. It seems that interest in the *Humorous Paragraphs* is moderate except in the younger grammar school groups where, especially among the girls, it stands high.

Among the replies given in Question 3 are a few indicative of real appreciation of the topical satirical qualities of writers like "Timothy Shy" or "Beachcomber." A boy (G. 15+) writes with insight of this kind: "Humorous paragraphs are often funny at the expense of Governmental blunders, thus revealing difficulties. They also deal with topical items." More usual are remarks like "Because Beachcomber is very good" (M.G. 16+); "I am very humorous myself. I like to laugh heartily. I like a joke" (M.E. 14+). "I like to tell my friends the funny spots" (F.E. 16+). Some specifically

mention that "it helps to direct your mind from the bitterness of war" (F.E. 17+); or that it "puts aside the War Horrors" (F.E. 14+).

TABLE X.
HUMOROUS PARAGRAPH.
(Percentage Interest Scores.)

AGE GROUPS.								
	13+	14+	15+	16+	17+	18+	20+	30+
Grammar, Boys	63	70	61	56	—	—	—	—
Grammar, Girls	68	78	63	64	—	—	—	—
Tech. and Elem., Boys and Men ..	40	44	44	56	54	55	53	42
Tech. and Elem., Girls and Women.	38	41	48	50	56	48	57	—

(m) MISCELLANEOUS ITEMS.

Each subject was invited to write down at the end of the list, any items in which he or she was interested, but which were not listed. In all groups there were some who made entries here as was to be expected since no list, unless it were twice as long, could hope to cover everything. But there were few who jotted down a feature omitted from the list and placed it as their first or second choice. Among the items most frequently occurring—usually unplaced—were: "Crime News" ("Scandal," "Murder Cases," "Court News"); Film, Radio and Book Reviews; Cross Words; and the Horoscope. Gardening Hints, Nature Notes, Births, Marriages and Deaths, Keep-fit articles, Stop Press News, Local History and news of scouts or army cadet units are also sporadically mentioned.

VIII.—DISCUSSION.

Like other instruments of mass culture—the cinema and radio for example—there is a large element of the stereotyped about the daily newspaper. A casual reader, glancing at any of the national dailies, with large circulations—the *Daily Express*, the *Daily Mail*, the *News Chronicle*, or the *Daily Herald*—would notice little superficial difference between them. Nor do they markedly differ from the large number of provincial dailies, many of which are owned by one or other of the great newspaper publishing companies. Many of the provincial morning and evening dailies, it is true, preserve a markedly local character and give a good deal of space to news and advertisements of purely regional interest. Yet the similarities are more marked than the differences. With a few notable exceptions there are the same techniques of simplification, the same emphasis on the "human angle," the same constituent parts—editorial, correspondence, home page, cartoon, strip or illustrated joke and the rest.

From this norm and at opposite extremes there are variations. Dailies like the *Times* or the *Daily Telegraph*, and one or two regional newspapers, like the *Yorkshire Post* and *Manchester Guardian*, stand out by their difference of format and printing, by the emphasis which they lay upon news of political or social importance and by the comparatively literary presentation of their matter. They stand out too in the range and variety of their special articles, many of which are the authoritative pronouncements of experts and not the

productions of professional journalists writing up second-hand facts. In contrast are the *Daily Mirror* and *Daily Sketch* (or *Graphic*). A glance at the *Mirror*; the number of readers of which in the entire population is exceeded only by that of the *Daily Express*, shews that it differs from the ordinary dailies in that it is even more adapted to hurried perusal, and makes even less demand upon literacy and sustained attention. Its pages are more numerous and less extensive than those of other national dailies which makes it easier to manipulate in crowded conditions—a fact commented on more than once by working adolescents. In proportion to the pictures and comic strips, the amount of reading matter which it carries is far less than that of the ordinary dailies. The news is conveyed by captions, sensational or facetious headlines and brief paragraphs rarely exceeding a sentence in length. There is nothing resembling a leading article in the accepted sense but instead one or two very short paragraphs which in a simplified way deal forthrightly with some topic of the hour. Noticeably more space is devoted to stories with a "human angle" and the more sensational happenings of the day, than to current political, social or economic issues. There is little to provoke serious thought, much to titillate, amuse and pass the time. Many youths describe it as "a scandal paper." It is not without significance that of a group of adolescent workers many of whom were backward especially in reading comprehension, the *Mirror* was the sole newspaper of nearly fifty per cent.,¹ that, of the names of the various local and national dailies cited by the subjects of this survey, most were spelt correctly except the *Mirror* which frequently appeared as "Mirrer," "Mirro," "Mirrow," and "Marro"; and that the highest readership of the *Mirror* is among the younger age groups, the lower economic strata and women generally.²

It is probably true to say that the crowded conditions of industrial and commercial life and of communal life in the services, the rush to get to and from work, and possibly the restlessness which affects so many youths in their teens, combine with intellectual and educational shortcomings to provide a public for the kind of paper that he who runs may read. It is certain that dailies of the quality of the *Times* or *Manchester Guardian* require sustained attention, leisurely uninterrupted perusal, and pre-suppose in their readers a level of interest and knowledge which does not seem to be common.³

Political and economic reasons probably have something to do with circulation though it is doubtful whether cheapness is a large factor in the choice of a daily, and the results of the last election won in the teeth of a hostile press suggest that the political views held by the reader are not as important a determinant of choice as might be expected. It seems more reasonable that we should regard the matter in another way and view the quality and content of the more widely read newspapers as a symptom. Circulation figures should perhaps be linked with such things as the proportions of illiterate and semi-literate adults in our population, and we should see in correct perspective the limitations of intellectual ability and the various social influences in the lives of adolescents which militate against the kind of leisured consideration of major social, political and economic issues characteristic of the best kinds of journalism.

Considerations of this kind serve to delimit the field of opportunity for the educationist, *vis a vis* the newspapers. We cannot hope to educate children by

¹ *The Decay of Educational Attainments among Adolescents*. This *Journal*, Vol. XIX, 1944

² *Hulton Survey*. Table 13 and *passim*.

³ Within the superficial similarities of other national dailies there is a considerable difference in the demands made upon the reader's attention and it is instructive to compare the readership figures given in the *Hulton Survey* (p. 26) with an estimate of the intellectual levels and reading ages presupposed by the several editorial staffs.

fulminating against the more superficial or violent forms of popular journalism, nor can we afford to ignore the press—or confine consideration of it to the atmosphere of the staffroom. The evidence provided by this study suggests that the habit of glancing at the family daily is established in most boys and girls prior to 13+; but it seems that, within the limitations imposed by the style, content and availability of newspapers, the teens are equally critical in the development of patterns of interest as they have proved to be in so many other aspects of the intellectual, emotional and social life. In the number and kinds of newspapers read and in the motives which prompt the choice, the range of variation from individual to individual, from group to group, and from age to age, seems to be marked. And these are fields in which restrictions are imposed externally. When the rise and decline of interest in the various features of the daily press is considered—a field in which greater freedom is possible—we find apparently fundamental changes with growth. Although the processes of growing interest in the newspaper as a whole and of a more adult distribution of attention, are not coterminous with the teens, one cannot escape the impression that, particularly with children of average and below average attainment and intelligence, the years from 13 to 15 or 16 are a time of radical change—they seem to constitute a critical period when systematic analysis of the methods and techniques of the press and an enlightened appraisal of its good and bad features would be of value as a means of educating the boy or girl who will be to-morrow's elector in the right and sensible use of a major instrument of our culture.

IX.—SUMMARY OF CONCLUSIONS.

The study just described is based on the replies of 1,284 adolescents and adults to questions concerning their reading of daily newspapers. The questions formed part of a questionnaire on reading interests which was administered in the autumn and winter of 1944 and the early months of 1945.

Ninety-two per cent. of the questionnaires issued for use were completed and returned. The final sample consisted of (i) 318 boys between the ages of 13·0 and 16·11; 275 girls of the same age range; 190 men between the ages of 17·0 and 40 and 142 women between the ages of 17·0 and 29·11. All these groups had a similar educational background, that of the elementary or junior technical school. Most of the adults, except a small proportion of the youngest ones, were in the services. (ii) Comparative groups of 194 boys and 165 girls between the ages of 13·0 and 16·11 from a selected grammar school. The socio-economic background and the regional provenance of all the adolescent samples was roughly similar. The adult group was more mixed in regional origins.

The major conclusions which appear to emerge are as follows:

1.—The habit of at least glancing daily at a newspaper seems well established by the age of 13 though, in the older groups of men (20+ and 30+) 10 per cent. or more do not read a daily paper.

2.—Few in any of the sub-divisions by age, sex, and education, appear to be readers of newspapers of the highest quality. On the other hand, the numbers of those reading illustrated dailies reaches high proportions in most of the adult groups, particularly among the women, and is higher generally in adolescence among the technical and elementary school children than it is among the grammar school samples.

3.—In most groups, nearly a half, or more, claim to read more than one newspaper daily. The average number read ranges between 1·4 daily (boys, technical and elementary 15+, women 18+) and 2·1 daily; (men, 17+).

4.—A consideration of the degree of interest displayed in the various groups in certain sections of the daily press showed that among boys, men and women, *Current News of the War* ranked first in importance. Among grammar school girls this item was second to *Readers' Letters* and among girls from elementary and technical schools it came after *Comic Strips, Pictures, Cartoons and Advertisements*. News of *Sport* came high in the favour of grammar school boys and of men; *Cartoons* and *Comic Strips* in the favour of boys from technical and elementary schools. *Leading and Political Feature Articles* are uniformly low in interest except in the group of men of 30+.

5.—A study of the interest scores in the various age, sex and education sub-groups for the main sections of the daily press showed :

- (a) High interest scores in most groups for *Current News of the War*. Among girls and women of technical and elementary school background the item starts a comparatively low, but with one check at 16+ rises in interest throughout the age range studied.

A supplementary question revealed that in all groups well over half, and in most two-thirds or more, claimed to read the headlines and some or all of the war news.

- (b) Comparatively high interest scores among girls and women for *Gossip and Domestic News*, and comparatively low ones for men. On the whole there seems, with increasing age, to be an upward trend of interest in this feature in all groups.
- (c) Moderately high interest scores among grammar school girls and boys for the *Leading Article* and scores steadily rising with age, for boys and girls, men and women, of technical and elementary school background.
- (d) A rise with age (with some fluctuations) in all groups in the interest scores for *Political Feature Articles*.
- (e) Interest in *Feature Articles of General Interest* seems to be highest in the grammar school groups, but there is a rise, with slight fluctuations, in the scores made by the other groups of boys and men, girls and women, throughout the age range.
- (f) In all groups, interest in the *Comic Strip* and *Cartoons* stands comparatively high at 13+. With some fluctuations, the scores returned by all groups for these items decrease with advancing age, though they remain comparatively high even at 16+.
- (g) Interest in *Advertisements*, higher among girls and women than among boys and men, shows a rise in the mid-teens in all groups followed by steady decline with some fluctuations.
- (h) Interest scores for *Pictures* are fairly high in all groups and at all ages.
- (i) *Sports News* stands high for boys and men and comparatively low for girls and women of technical and elementary school background, though grammar school girls, with some fluctuations, seem to take more interest in it. Among men, the interest score rises fairly steadily with age.
- (j) With some fluctuations, interest in *Readers' Letters* rises in all groups throughout the age range studied. It is highest among grammar school girls, next highest among grammar school boys, lowest among boys and men of technical and elementary, background.
- (k) Interest in the *Military Correspondent* is moderately high among grammar school boys and girls and among boys and men from technical and elementary schools. Interest is low among the groups of adolescent girls from technical and elementary schools, but the groups of service women show a sharp increase in interest.

- (l) *The Humorous Paragraph* stands highest in favour in the grammar school groups though interest declines somewhat after 14+. In the technical and elementary groups there is a rise from 13+ to 16+ or 17+ followed by a slight decline in the case the of men.

6.—The whole study draws attention to the importance of the daily newspaper in the lives of adolescents and adults. The evidence suggests that the early and middle teens are as crucial in the development of newspaper reading habits as they are in other directions. There is little evidence to suggest that adolescents of an elementary or technical school background can, unaided, in their teens form serious, critical attitudes towards the popular press. Even the grammar school boys and girls, exceptionally favoured by innate intelligence and by education, do not seem to have formed by 16+ ideal attitudes towards the press. The study suggests that although newspaper reading habits are to some extent the product of environmental conditions, much could be done by specific training in schools both to improve the newspaper reading habits and attitudes of adolescents and indirectly to influence the content of the daily press.

ACKNOWLEDGMENTS.

The help of those, colleagues and others, who were kind enough to collect much of the material on which this study is based, is acknowledged in detail in the text. It remains for the writer to express his grateful thanks to Miss E. M. Smith, M.A., who carried out the preliminary analysis of the girls' questionnaires and some of those from the adult groups, and to Mr. N. Jackson, B.A., who was kind enough to check many of the calculations.

THE ORIGINS OF INTEREST AND MOTIVES FOR STUDY OF NATURAL SCIENCES AND PSYCHOLOGY AMONG ADULT STUDENTS IN VOLUNTARY COURSES.

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I.—*Object and scope of the enquiry.* II.—*The conduct of the enquiry.* III.—*Natural sciences:* (1) *The origins of the interest;* (2) *The motives and their analysis;* (3) *Results and deductions;* (4) *Summary of conclusions.* IV.—*Psychology:* (1) *The origins of the interest;* (2) *The motives—Results and deductions;* (3) *Summary of conclusions.*

I.—OBJECT AND SCOPE OF THE ENQUIRY.

THE Extra-Mural University Departments, the Workers' Educational Association, and similar organisations provide lecture courses for those people who wish to continue the study of their school subjects, or of related subjects, for their own pleasure and culture. These bodies do not intentionally provide vocational or technical training. This article gives an account of an investigation which was made to determine the motives of such people who attend courses in natural sciences and in psychology, and the origins of their interest in these subjects.

The scientific interests of school children have been investigated by Rallison,¹ Ball² and others, but interests are not the same as motives. Hoy³ examined the interests and motives of adults attending evening classes in a large city. His investigations were not confined to science and were of a general nature. The British Association for the Advancement of Science has expressed some opinions on the motives of adults who follow science courses of the kind we are considering. We read⁴ "The aims and motives of the students attending adult classes are less definite and more difficult to interpret. They are probably very mixed and change as their interest and knowledge increase." The first sentence is a statement without evidence. The second sentence expresses, as an opinion, a probability. Facts are obviously required.

In the present enquiry we attempted to ascertain the motives of these adults, to determine the relative importance of the motives, and to investigate any significant variation of motive with subject, sex and age. We also attempted as a subsidiary aim, to determine the origin of the interest.

We approached the Extra-Mural Departments of all universities and university colleges in England and Wales. All of these bodies responded ;

¹ *Brit. Journ. Ed. Psych.*; Vol. IX; Part II.

² *School Science Review*; Nos. 67; 68.

³ *Brit. Journ. Ed. Psych.*; Vol. III, Part I.

⁴ British Association Reprints (N.S. No. 32, p. 347).

some also put us into touch with classes arranged by the W.E.A. The number of science classes available was small¹ but the enquiry fairly covered the courses throughout England and Wales. The diversity of age, schooling, and occupation showed that we had taken a very fair sample. Information was received from fifty-five classes in natural sciences and fifteen classes in psychology. Unfortunately, the enquiry was made in the early months of 1947 when severe weather restricted attendances. Perhaps this restriction had the advantage that the students who attended had clearly-cut motives. In natural sciences, 652 students were present on the days when the enquiry was made and 626 furnished information; in psychology 193 students out of 196 furnished information.

II.—THE CONDUCT OF THE ENQUIRY.

The necessary information was obtained by means of printed questionnaires. The preliminary questions asked for details of sex, age (in ten-year groups), occupation, and nature of schooling. A list of possible motives (lettered (a) to (l)) was provided and a blank space (m) provided for additional motives. This list was drawn up after the experience of trial tests with local Extra-Mural classes, and is set out in detail in Section III (2) later. The order of motives was slightly mixed, chiefly to spread out the "improper" motives. The rubric ran as follows:

"Why do you attend this science course? To get knowledge, we presume, but why do you want the knowledge? Do you attend for other reasons as well? Mark these possible reasons as follows:

Put A against the chief reason (or reasons).

B against any reasons which might have some weight.

X against any reasons which, you are sure, have no weight.

You may add further reasons, if necessary, at (m)."

The criticism may be made that students should have been invited to state their motives without prompting, that it was unfair to suggest motives to them. Experience had shown that unprompted responses were very shallow. Our list made the students think more carefully. They obviously thought beyond the range of our list for space (m) was frequently used. In many cases the information recorded there could have been resolved into one or more of our suggested motives, but fresh motives were given in 19 per cent. of the questionnaires. This indicates that there was a good deal of independent thought. Two fresh motives (specified later) occurred sufficiently often for us to tabulate them separately.

In the attempt to determine the origin of the interest, the following questions were asked:

"In what branch of science did you first become interested? How did you first become interested in science? Mark any of the following and add others if necessary: Father, brother, etc., books, magazines, broadcasts, school, lectures outside school, instructional films . . ."

The questionnaire for psychology students was very similar to that used for students of natural sciences but the wording was adjusted so as to be directly appropriate (see page 114).

Tutors were asked to send us a copy of the syllabus of the course.

¹ Hoy notes this. There is reason to believe that the position is improving.

III.—(1) THE ORIGINS OF THE INTEREST IN NATURAL SCIENCES.

We were not surprised to find that many students marked more than one origin. We assessed each student's vote at 1 and, if n origins were marked, assigned a vote of $1/n$ to each of them. The results were separately tabulated for the sexes and each sex sub-divided into two groups:

A.—Those who had studied science at school.

B.—Those who had not studied science at school.

In Table I, which presents these results, the votes for each origin are expressed as percentages of the total votes cast in each section.

As we might expect, the predominant origin in group A of both sexes is the study of science at school. (It is possible, however, that in some cases the origin dated from pre-school days, but was not recalled.) It is surprising, and of great interest, to discover that even in this group books and magazines played an important part in stimulating interest. This was particularly so with males. It is possible that, in some cases, science was studied with other subjects at school, but made no particular appeal, and that later books and magazines put life into dry bones. It appears that, in a similar way, out-of-school lectures played some part.

TABLE I.
ORIGINS OF INTEREST (NATURAL SCIENCES).
(Percentages of answers within each sub-group.)

		<i>No. of persons</i>	<i>Relative</i>	<i>Friend</i>	<i>School</i>	<i>Books Magazines</i>	<i>Lectures</i>	<i>Broadcasts</i>	<i>Films.</i>	<i>Misc.</i>	<i>No statement.</i>
Females	A. Science at School	148	8.3	1.6	37.8	18.2	12.8	7.0	1.7	1.9	10.7
	B. No Science at School	94	11.0	2.1	2.1	21.3	21.3	12.3	2.3	1.1	26.5
Males	A. Science at School	204	4.8	0.5	33.0	27.6	8.3	5.1	1.1	4.4	15.2
	B. No Science at School	162	4.5	3.7	2.7	31.1	14.2	8.7	3.0	8.7	23.4

A far greater proportion of group B (no science at school) gave no answer to this part of the questionnaire. It is probable that these people found greater difficulty in recalling or "pinning down" the origin(s) of their interest. The outstanding origins are books and lectures. It may be argued that lectures cannot form an origin of an interest. Why did the people go to the lectures? As similar questions can be put in respect of books, broadcasts, and films, and as further information is lacking, we can only take the results at their face values. The relatively large percentage of miscellaneous origins in the case of males chiefly comprised "work."

The tabulation permits comparison of the sexes. The difference in the miscellaneous origins is significant.¹ This is due to the influence of work (usually semi-technical) in the case of the males. The differences in the book-origin are interesting. In group A, $D/r=2.1$ and in group B, $D/r=1.8$. There

¹ Let D =actual difference; r = standard error of the difference. Then if $D/r=3$ (or more) we have called the difference 'significant'; if D/r lies between 2 or 3 we have called the difference 'suggestive.' This terminology is strictly used in all discussions in the remainder of the article.

is a suggestion, therefore, that men have found books and magazines a greater source of interest.

In comparing the two groups A and B, the difference in school-origin, of course, is significant. The relative failure of the females of group B to provide an answer is also significant, and that of the males is suggestive. It is suggestive too that the lecture-origin, for both sexes, is more marked with group B.

Exact origins are difficult to determine. We have only brought the general trends to light. We suggest that exact origins can only be elucidated by personal contact and intensive cross-examination. Such a course, however, is not possible with the large numbers required for general conclusions.

III.—(2) THE MOTIVES AND THEIR ANALYSIS (NATURAL SCIENCES).

For the purposes of analysis and tabulation the motives are grouped under three headings (plus an additional group for miscellaneous motives). This grouping (which was not given on the questionnaire) is not meant to be rigid. It simplifies the understanding of Table II and permits an easier presentation of Tables III and IV.

LIST OF MOTIVES.

Vocational motives :

- (a) The knowledge will help me with my work.
- (b) The knowledge will help me to pass an examination.
- (c) The knowledge will help me to get a better job.

General desire for knowledge :

- (d) I feel ignorant and "out of it" when other people talk about scientific matters, and I cannot understand their conversation.
- (e) I want to feel I know more than my friends.
- * (f) I am interested in all branches of science.
- * (g) I am interested in this particular branch of science.
- (h) I feel I cannot understand the present world without knowing more science than I do.
- (i) I want to know how scientists think, how their ways of thinking differ from those of literary men, lawyers, politicians, etc.

Social and Recreational motives :

- (j) I attend the classes to fill in an evening.
- (k) The classes help me to see and mix with other people.
- (l) My friend is interested in science and I want to share his (or her) interest.
- (m) Science will help me with my hobby.
- (n) I thought I would like to study science as a change from my work.

Miscellaneous :

- * (o) Miscellaneous motives.

* These motives were not suggested on the questionnaire.

Motive (f) appeared in various guises, e.g., interest in nature generally, "science provides an interesting mental exercise." The miscellaneous motives were unimportant and, at times, amusing. Typical motives were "To enlighten my children." "I always go to W.E.A. classes; this year we are doing biology."

The various courses in natural sciences were put into five groups : Biology,

Geology, Physical Sciences,¹ General Science, Social Science. The title of a course was often sufficient to indicate the appropriate group; in doubtful cases the syllabus was consulted. Biology included both pure and applied branches, but the viewpoint was that of a scientist. In Social Science the viewpoint was that of a sociologist, i.e., how scientific (mainly biological) facts, theories, and development affect the activities, growth, and responsibilities of the individual and the community. General Science covered such titles as "Science in Everyday Life," "The Science of Everyday Things."

In the detailed analyses the results for each subject group were further divided into sex groups and age groups. Some of these sub-groups are small. The results in such groups are of interest, and may indicate tendencies, but we have not based important conclusions on these results. In all tables we show the number of students in each group.

The method of scoring is explained in the Appendix. The total vote for each motive in each group is expressed as a *percentage* of the total vote within that group. In Table II the A votes are shown in the top line and the B votes in the lower line. Space does not permit the presentation of the B votes in the other tables. *It is to be understood that the B votes were found to support the indications of the A votes in all cases where no special comment on B votes is given.*

III.—(3) RESULTS AND DEDUCTIONS (NATURAL SCIENCES).

Extra-mural departments and similar bodies are not primarily concerned with provision for vocational or technical training, but rather with the serious presentation of scientific methods and results, both pure and applied. These two kinds of teaching inevitably overlap. Hence, although we shall not expect students' motives to be strongly vocational, we may find that some students attend the courses partly for vocational reasons.

Table II presents the detailed analysis of the motives for the whole field of natural sciences. The outstanding motive, for both males and females, is (*h*). Students feel that, in order to understand the present world, a greater knowledge of science is required. If understanding the present world is a worthy motive (and few would deny that it is) this investigation indicates the direction in which instruction in popular science should be turned. Further, this positive assertion that knowledge of science is necessary for understanding the present world indicates that greater provision for the dissemination of popular science should be made. The fairly heavy vote for motive (*i*) (how scientists think) is probably associated with that for (*h*). The vocational motive (*a*), we find, is fairly strongly marked. The votes for motives (*m*) and (*n*) are interesting. Both sexes find science a pleasant relief from their daily work—an encouraging result for the instructor—and men, particularly, find that science helps them with their hobbies. (From remarks on the questionnaires we learned that such hobbies included gardening and bee-keeping, but we suspect that in many cases science itself is the hobby.) The "improper" motives (*e*) and (*j*), not unnaturally received few votes. Among the B votes we note (besides the supporting votes for (*h*), (*i*) and (*n*)) the heavy vote for (*k*) (to see and mix with other people). This purely social motive is in accordance with expectations and is applicable to lectures on any subject.

This consideration of natural sciences as a whole reveals little difference between the sexes. The difference (in the A votes) for (*m*) is significant, and those for (*d*) and (*o*) highly suggestive.

¹ Mainly Physics and Chemistry. It includes one questionnaire from a student in an astronomy class; the papers from the other four of this class were discarded as useless.

TABLE II.

MOTIVES OF ALL STUDENTS OF NATURAL SCIENCES.

(As percentages of the total vote within each group.)

Questionnaires discarded as useless : 18.
 Useful questionnaires : Female, 242 ; Male, 366.

Students present : 652 in 55 classes.
 Questionnaires returned : 626.

	Vocational.			General Desire for Knowledge.								Social and Recreational.						Misc.	
	a	b	c	Total	d	e	f	g	h	i	Total	j	k	l	m	n	Total	o	
ales (242)	A	14.2	1.3	0.4	15.9	8.6	0.2	4.1	3.0	22.6	9.6	48.1	1.3	4.3	2.7	6.2	16.5	31.0	5.0
	B	6.9	1.1	2.7	10.7	9.9	1.6	0.6	—	15.2	16.4	43.7	3.3	18.5	4.5	5.0	12.8	44.1	1.5
s (366)	A	15.1	3.5	2.6	21.2	4.0	0.3	5.5	2.2	24.5	9.1	45.6	1.1	3.0	2.0	13.9	12.3	32.3	0.9
	B	5.9	3.3	4.2	13.4	8.9	3.1	0.8	0.7	13.2	16.9	43.6	3.3	15.0	3.0	8.5	12.2	42.0	1.0
tudents	A	14.8	2.6	1.7	19.1	5.8	0.3	4.9	2.5	23.8	9.3	46.6	1.2	3.5	2.3	10.8	14.0	31.8	2.5
	B	6.3	2.4	3.6	12.3	9.3	2.5	0.7	0.4	14.0	16.7	43.6	3.3	16.4	3.6	7.1	12.4	42.8	1.3

Table III shows the A votes, for each sex, in each of the subject groups. (In the original analysis the votes for each of the motives (*a*) to (*v*) were separately determined. In this article the motives have been grouped but reference is made to particular motives in cases where the results are noteworthy.) We seek any variation of motive with subject, and with sex within each subject.

The "cultural" motives are strong in all subjects, but particularly so in the Social Sciences. The cultural motive of males in this subject is significantly or suggestively higher than that in any other subject. With females the motive is significantly or suggestively higher than that in Biology and Geology.¹ This cultural motive is chiefly made up of (*h*)—to understand the present world—and (*i*)—to learn how scientists think, etc. The figures are F.31 per cent., M.35 per cent. and F.16 per cent., M.15 per cent., respectively. We see then that Social Sciences, particularly, provide that general scientific knowledge which non-academic people seek. It appears best to satisfy the desire to understand the present world. In other subject groups, too, (*h*) and sometimes (*i*) were the chief factors in the "cultural" motives, but they were not strong in Geology.

The vocational motives for studying Social Sciences are weak, as might be expected. In Geology and General Science we notice interesting sex-differences. Males pursue these studies with much more strongly marked vocational intents. This is, indeed, the only real sex-difference which the tabulation reveals.

TABLE III.
MOTIVES FOR EACH SUBJECT GROUP AND SEX.
(Percentages of total A vote in each group.)

<i>Subject Group.</i>	<i>Sex.</i>	<i>No.</i>	<i>Vocational.</i>	<i>Desire for Knowledge.</i>	<i>Social and Recreational.</i>	<i>Miscellaneous.</i>
Biology ..	F	103	21.3	39.5	35.3	3.9
	M	146	19.8	43.8	35.8	0.6
Geology ..	F	32	8.9	35.3	51.6	4.2
	M	61	30.2	28.8	38.5	2.5
Physical Sciences	F	14	35.7	44.7	19.6	—
	M	32	30.6	40.8	28.6	—
General Science	F	19	13.2	64.4	22.4	—
	M	47	30.1	45.1	24.8	—
Social Sciences	F	74	8.3	62.3	20.4	9.0
	M	80	8.3	63.9	26.6	1.2

The chief factors in the social and recreational group were (*m*) (hobbies) and (*n*) (change from work.) This was so in Biology (F.7 per cent., M.20 per cent. for (*m*) and F.20 per cent., M.13 per cent. for (*n*.) Males, particularly, find biology of help in their hobbies (possibly including gardening) and both sexes find it a welcome change from their work. The figures are also high for Geology (F.22 per cent., M.20 per cent. and F.21 per cent., M.8 per cent.) It is probable, not that Geology helps with a hobby, but that Geology is itself the hobby—a suggestion which is supported by the female vote for (*n*). The purely social motive (*h*)—to see and mix with other people—received a small A vote in all subjects, but, as one would anticipate, a strong B vote. Usually the female vote was higher than that of the males.

¹ And, we suspect, Physical Sciences, but the number is inadequate for a conclusive statement.

Table IV shows the variation of A votes, in each subject (other than the small Physical Sciences group), with age. The decline of vocational motives with age is strikingly brought out in most of the groups. Detailed analysis showed that this decline was *partly* due to the diminution and/or cessation of motives (b) and (c). In contrast, the cultural motives generally intensify with age, but in Social Science they are fairly steady and high. The social and recreational motives are fairly steady within each subject group. Variations appeared, however, in the B votes. The purely social motive (k)—to see and mix with other people—received a strong B vote in most subjects, and, except for Geology, intensified with age. The following figures indicate the nature of this variation with age.

Biology: F.—From 7 to 23 per cent. ; M.—From 6 to 22 per cent.

Geology: F.—From 29 to 21 per cent. ; M.—From 26 to 7 per cent.

General Science: F.—From 3 to 10 per cent. ; M.—From 4 to 11 per cent.

Social Science: F.—From 18 to 35 per cent. ; M.—From 16 to 27 per cent.

The miscellaneous motives of the older females in Social Science are interesting. The chief of these motives is the general desire to become a better mother.

TABLE IV.
VARIATION OF A MOTIVES IN NATURAL SCIENCES WITH AGE (PERCENTAGES).

	No.	Vocational.	Desire for Knowledge.	Social and Recreational.	Miscellaneous
BIOLOGY:					
Females under 30	32	38.6	22.0	33.2	6.2
Females, 30-40 ..	33	15.4	46.8	34.9	2.9
Females over 40*	38	11.7	47.4	38.3	2.6
Males under 30 ..	20	43.7	24.2	32.1	—
Males, 30-40	37	26.6	45.3	28.1	—
Males, 40-50	46	12.5	46.8	38.9	1.8
Males over 50 ..	43	10.5	48.6	40.9	—
GEOLOGY:					
Females under 40	18	8.3	28.7	58.4	4.6
Females over 40	14	9.5	44.0	42.9	3.6
Males under 30	15	50.0	24.4	25.6	—
Males, 30-40	14	25.0	14.9	60.1	—
Males, 40-50	15	25.6	38.9	35.5	—
Males over 50	17	20.6	35.1	35.5	8.8
GENERAL SCIENCE:					
Females under 40	10	15.0	53.4	31.6	—
Females over 40	9	11.1	76.7	12.2	—
Males under 40	22	52.3	24.7	23.0	—
Males over 40	25	10.7	62.7	26.6	—
SOCIAL SCIENCE:					
Females under 30	14	19.1	60.6	20.3	—
Females, 30-40 ..	22	11.4	64.0	22.3	2.3
Females, 40-50 ..	22	4.5	56.1	21.2	18.2
Females over 50	16	—	69.8	16.7	13.5
Males under 30	8	6.2	71.9	21.9	—
Males, 30-40	15	28.3	49.4	15.6	6.7
Males, 40-50	28	3.4	68.6	28.0	—
Males over 50	29	3.1	64.6	32.3	—

* Includes 6 over 50.

III.—(4) SUMMARY OF CONCLUSIONS (NATURAL SCIENCES).

- 1.—Motives are certainly mixed and show variations with subject and age.
- 2.—Males have a rather greater vocational interest in science, but in general the motives show little variation with sex.
- 3.—The predominant motive is the desire to understand the present world, with the implication that a study of science is necessary for this purpose.
- 4.—Social Sciences are thought best to provide this general scientific culture.

IV.—PSYCHOLOGY—(1) THE ORIGINS OF THE INTEREST.

We attempted to elucidate the origin of interest in psychology in a similar way to that used for natural sciences. The same list of possible origins was presented. We found that "lectures at school" was in no case an origin but that work and examinations were often an origin of interest. We assigned a mark of $1/n$ to each of n origins marked by one student. The results are tabulated for the sexes separately and the marks expressed as percentages of the total mark-cast in each group.

TABLE V.
ORIGINS OF INTEREST IN PSYCHOLOGY.
(Percentages.)

	<i>No. of per- sons.</i>	<i>Rela- tive.</i>	<i>Friend</i>	<i>Books and Maga- zines.</i>	<i>Lec- tures.</i>	<i>Broad- casts.</i>	<i>Films.</i>	<i>Work. Exams.</i>	<i>Misc.</i>	<i>No. state- ment.</i>
Male ..	85	2.4	21.6	32.9	11.8	9.8	2.3	4.7	3.6	10.9
Females..	105	10.9	19.5	23.2	13.7	5.6	3.3	10.0	7.1	6.7
All Students	190	7.1	20.5	27.6	12.8	7.5	2.8	7.6	5.5	8.6

The results (Table V) reveal interesting information. Interest in psychology (for this batch of students) originated mainly from the reading of books and magazines, and from the influence of friends. This applied to both sexes. We note also that, for females, work and examinations (presumably social welfare work) and the influence of relatives (father, brother, etc.) account for a fair proportion of the origins. The question of origin of interest in psychology needs wider investigation. It would be interesting to confirm (or refute) these results, to elucidate more precisely the nature of the friend's influence, to ascertain the types of books and magazines, and to discover at what age the interest in psychology originated.

IV.—(2) THE MOTIVES, RESULTS AND DEDUCTIONS (PSYCHOLOGY).

As has already been indicated, the list of possible motives submitted to students in psychology was similar to that submitted to students in natural sciences. In general, the word "psychology" replaced "science." In particular, motives (h) and (m) of the science list were deleted as unsuitable, and three new motives ((i), (j), (k) in the list below) inserted. Three other motives ((f), (g), (l) in the list below) were not presented on the questionnaire but appeared with sufficient frequency to warrant separate tabulation. For convenience of

analysis we have classified the motives under four headings, but this classification was not given on the questionnaire.

LIST OF MOTIVES.

Vocational motives :

- (a) The knowledge will help me with my work.
- (b) The knowledge will help me to pass an examination.
- (c) The knowledge will help me to get a better job.

General desire for knowledge :

- (e) I feel ignorant and "out of it" when other people talk about psychology, and I cannot understand their conversation.
- (e) I feel I want to know more than my friends.
- * (f) I am interested in all kinds of science and/or knowledge.
- * (g) I am interested in psychology.
- (h) I want to know how psychologists think, how their ways of thinking differ from those of literary men, lawyers, politicians, etc.

Practical (non-vocational) use of psychology :

- (i) Knowledge of psychology may help me to solve a personal problem.
- (j) Knowledge of psychology will help me to understand other people.
- (k) Knowledge of psychology may help me to influence the behaviour of other people.
- * (l) To help me to understand and bring up my children.

Social and Recreational motives :

- (m) I thought I would like to study psychology as a change from my work.
- (n) I take the classes to fill in an evening.
- (o) The classes help me to see and mix with other people.
- (p) My friend is interested in psychology and I want to share his (or her) interest.

Miscellaneous :

- * (o) Miscellaneous motives.
- * These were not printed on the questionnaire.

The votes for the motives were assessed, combined, and tabulated as in the natural science investigation. Table VI shows the A votes (as percentages within each sub-group) for the classified motives, arranged by sex and age.

The most obvious feature of the tabulation is the heavy vote for practical (but non-vocational) motives. Students hope to gain from the lectures knowledge which will help them to understand and influence the behaviour of other people and of themselves. Vocational motives occupy the second position. Another feature is the lack of variation in the gross marks between the sexes. Although there is a tendency for females to be more actuated by vocational motives, and males by a general desire for knowledge, no differences are statistically reliable.

The variation of motive with age is most interesting. Except for the somewhat irrelevant social and recreational motives, the motives of males are surprisingly independent of age. The motives of the females, however, show considerable variation with age. The vocational motives rise to a maximum in the 30-40 age group (not, as in many other subjects, in the youngest age-group) and decrease markedly at higher ages. The practical (non-vocational) motives and the social and recreational motives come sharply to the fore with the older females. The general desire for knowledge is irregular.

TABLE VI.

PSYCHOLOGY—GROSS CLASSIFICATION OF A VOTES BY SEX AND AGE.
(Percentages.)

	No.	Vocational.	Desire for Knowledge.	Practical Use.	Social and Recreational.	Miscellaneous.
Females :						
Under 30 ...	41	30.3	12.4	43.8	12.7	0.8
30-40	35	45.8	4.4	43.6	6.2	—
40-50	18	24.5	16.9	49.9	8.7	—
Over 50	11	1.5	4.5	61.3	32.7	—
All females	105	31.5	9.7	46.6	11.9	0.3
Males :						
Under 30 ...	28	23.0	12.8	48.2	8.9	7.1
30-40	21	25.4	19.1	37.9	17.6	—
40-50	27	22.6	16.8	42.9	17.7	—
Over 50	9	27.8	22.3	42.5	7.4	—
All males	85	23.9	16.7	43.3	13.7	2.4
All females and males.	190	28.2	12.8	45.1	12.7	1.2

Table VII gives the detailed analysis of the A votes. We draw attention to a few of its indications. The decline of the female vocational motives with age appears partly as a cessation of motives (b) and (c). Motive (j)—the understanding of other people—is the biggest factor in the practical (non-vocational) motives, and, in most groups, the predominant motive. It is interesting to note that the marked rise in the practical motives of the highest female age-group (based, unfortunately, on small numbers) is due to motive (i)—the solution of personal problems. This motive received a fairly heavy B vote (average 12 per cent.) by all females and, markedly, by the 40-50 male group (22 per cent.). Motives (h) and (k) also received a fairly strong B vote (F.14 per cent., M.15 per cent. and F.13 per cent., M.12 per cent., respectively). Motive (o)—to see and mix with other people—received a female B vote of 13 per cent., but a very small male B vote.

IV.—(3) MAIN CONCLUSIONS (PSYCHOLOGY).

- 1.—The predominant motives are practical but non-vocational.
- 2.—The most marked single motive is the understanding of other people.
- 3.—Vocational motives are strong (except for older females).
- 4.—There is little difference in the motives of heterogeneous groups of males and females, but whereas the motives of males are almost independent of age, those of females vary with age.

This investigation was made possible by the willing co-operation of directors and tutors of Extra-Mural and W.E.A. bodies. We express our indebtedness to them.

TABLE VII.
 PSYCHOLOGY—DETAILED ANALYSIS OF MOTIVES.
 (A votes as percentages.)

	No.	Vocational.			General Desire for Knowledge.					Practical (Non-vocational)				Social and Recreational.				Misc.	
		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	
under 30	41	19.1	6.1	5.1	6.5	1.8	—	—	4.1	9.3	30.3	3.0	1.2	3.3	—	5.7	3.7	0.8	
30-40 ..	35	30.1	10.0	5.7	0.9	0.6	—	1.0	1.9	7.1	24.4	6.4	5.7	1.3	—	0.6	4.3	—	
40-50...	18	24.5	—	—	7.4	—	1.0	2.8	5.7	10.8	31.2	7.9	—	1.8	11.0	4.8	1.1	—	
over 50	11	1.5	—	—	4.5	—	—	—	—	24.6	30.7	1.5	4.5	15.1	6.4	3.3	7.9	—	
es	105	21.9	5.7	3.9	4.6	0.9	0.2	0.8	3.2	10.4	28.6	4.8	2.8	3.6	0.8	3.6	3.9	0.3	
er 30	28	15.6	4.3	3.1	1.8	0.6	3.6	—	6.8	5.9	27.8	14.5	—	2.7	0.9	4.4	0.9	7.1	
40	21	21.5	2.4	1.5	6.1	—	4.8	—	8.2	4.5	23.5	9.9	—	9.9	—	6.3	1.4	—	
50	27	17.1	2.0	3.5	1.5	—	2.0	1.5	11.8	8.5	27.1	7.3	—	8.5	—	8.7	0.5	—	
r 50....	9	25.0	2.8	—	5.6	—	5.6	—	11.1	11.1	18.5	12.9	—	1.8	—	5.6	—	—	
.....	85	18.5	2.9	2.5	3.2	0.2	3.6	0.5	9.2	6.9	25.5	10.9	—	6.2	0.3	6.4	0.8	2.4	
nts	190	20.4	4.5	3.3	4.0	0.6	1.7	0.7	5.8	8.9	27.1	7.5	1.6	4.8	0.6	4.8	2.5	1.2	

APPENDIX.

In devising a method of scoring the votes for the various motives, two problems arose :

(1) What is the most satisfactory way of dealing with multiple votes; i.e., two or more motives marked by one person with an A or with a B?

2.—By what means, if any, can A votes (main reason) and B votes, (subsidiary reason) be combined?

The extent of multiple voting by science students is shown in Table VIII.

TABLE VIII.
MULTIPLE VOTING.

	No. of A Votes.				No. of B Votes.				
	1	2	3	4 or more	0	1	2	3	4 or more
Females (242) ..	52%	25%	15%	8%	15%	17%	30%	18%	20%
Males (366)	46%	24%	16%	14%	15%	28%	23%	19%	15%

It was decided that the problem of multiple A votes was most satisfactorily solved by assigning a mark of $1/n$ to each of n motives marked with an A. This overlooks the effect of the number of accompanying B votes. We recognise that the absence of B votes (15 per cent.) indicates a stronger A vote, but we felt that the effect was small in cases where the A vote was split. A *single* A vote with no B votes, however, is a very strong vote. Examination showed that this occurred only in twenty-two cases out of 608 (3.2 per cent.). We felt that the effect of this on the gross total would be too small to warrant mathematical allowance for it, if indeed a satisfactory allowance could be devised. We, therefore, merely assigned marks $1/n$ as already explained. In the same way we assigned a mark of $1/n$ to each of n motives marked B. The final percentages were based on the actual number of people giving B votes.

It is impossible to draw a sharp line of demarcation between main motives (A) and subsidiary motives (B). It was apparent that some students found difficulty in making the distinction. In extreme cases, a student gave one A vote and several B votes, or *vice versa*, but such extremes probably "balance up" in the averages. In view of the obvious difficulty of assessing the relative values of A and B votes, we decided not to combine A and B votes. They were analysed separately.

BOOK REVIEWS.

Mental and Scholastic Tests: SIR CYRIL BURT. (Staples Press, Ltd., third edition, pp. xxii+467, 35s.)

This book, originally published in 1921, made history. In 1913 the London County Council appointed Cyril Burt as psychologist in the Education Department. This in itself was an innovation. The primary motive for the appointment was the need for a more scientific method of selecting those children who could not profit by the ordinary methods of education, and were consequently certified as mentally defective by the school medical officers, and transferred to special schools. A problem of almost equal importance was that of allocating pupils for further education, whether at secondary schools with an academic bias, central schools, trade schools, schools of art and the like—a problem which is once again very much to the fore. And generally the primary task of the school psychologist was to assist teachers in detecting both supernormal and subnormal pupils—the dull, the backward, the delinquent, and the neurotic.

At that date, it must be remembered, what is now called child guidance was almost unknown, and its techniques at best uncertain. Its present development is to a large extent the result of the early researches of the author of this book.

The book itself consists of three memoranda. The first gives in detail the London Revision of the Binet-Simon tests, with full instructions for their use. The second memorandum reports the results of a general survey of schools, determines the line of demarcation between normal pupils and the mentally defective, assesses the influence of sex, social status, and fertility on tested intelligence, and examines the diagnostic value of the tests themselves. Here Burt further proposed a number of original tests, of a type then new to teachers—non-verbal as well as verbal, group as well as individual, most of which (like the analogies, the maze tests, matrix tests, reasoning tests, etc.) have since come into regular use. The last memorandum gives a complete set of standardized tests for the chief subjects of the elementary curriculum—reading, spelling, arithmetic, writing, drawing, handwork and composition. The aim of such tests, as the author repeatedly insists, is not to criticize the results produced by the teacher, but to assist in objective inquiries, and to aid the teacher to discover who are backward, what are the causes of their backwardness, and what are the most appropriate methods of treatment.

The volume, however, is concerned quite as much with the theoretical investigation of methods as with the practical construction of serviceable tests. As the preface points out, a number of the technical procedures that have since become commonplace in psychological investigations were introduced for the first time—item-analysis, partial regression, representative sampling, scaling tests by percentage scores, and various methods of factorial analysis. Most of these were based on procedures recently developed by Galton and Karl Pearson; but others, like the centroid formula for factor analysis, the use of correlation between persons, and of graphs for tetrachoric correlations, were of the author's own devising.

Although the book deals primarily with children of school age, the more recent attempt to use psychological tests among adults both in choosing recruits for the Armed Forces or the Civil Service and in vocational guidance and selection in the field of industry, has revealed much the same problem, and demands much the same methods. The methods of investigation worked out in this volume have been widely adopted in various branches of individual psychology since the book was first published, and call for still further applications.

In the new edition numerous modifications or additions have been made to bring the work more up to date. Several shorter memoranda taken from the Reports of the Psychologist to the Council and now no longer available, have been incorporated.

In his introduction to the present edition, Sir Cyril Burt answers the criticism that he has over-estimated the importance of intelligence and knowledge, and neglected the emotional parts of the child's mental make-up. He points out that such

an approach deals merely with one aspect of the child's whole personality, and that "tests infinitely more scientific than those set out in this book can still be but the beginning, never the end, of the examination of the child." The study of physical, social, and temperamental factors is equally essential.

Unlike many books on the subject, it is really human as well as scientific. The problem of the individual is never lost in the statistics of the group; and the author never mistakes the means for the end, which is the diagnosis and treatment of the individual child. As Sir Robert Blair remarks in his Preface: "Burt's results provide, as it were, a first sketch of the intellectual and educational progress of the average child throughout the years of elementary school life." And in view of the increasing use of standardized tests throughout our schools and the need to construct and standardize new tests, the re-issue of this book is most timely. M.S.

Forty-Four Juvenile Thieves: Their Characters and Home-Life: JOHN BOWLBY, M.A., M.D. (Baillière, Tindall and Cox, 1946, pp. 56, 7s. 6d.)

In this brief but interesting book the characters and psychiatric history of forty-four juvenile thieves referred to a Child Guidance Clinic, are compared with those of forty-four children also referred to the clinic who did not steal. The thieves were classified according to their characters and the most significant fact that emerged from this classification was that, while there were no "Affectionless Characters" among the control group, there were fourteen among the thieves, and these constituted more than half of the more serious and chronic offenders. The author argues that these Affectionless delinquents "constitute (*sic*) a true psychiatric syndrome hitherto only partially recognised," and he ends with a plea for early diagnosis and treatment, since it is possible to diagnose an Affectionless character at the age of three and possibly earlier. Above all attention should be given to prevention, as many separations of the child from his mother are avoidable.

A disquieting feature of the work, which reduces its value as a scientific study of the delinquency, is the superficial way in which the author in several cases arrives at an estimate of the intelligence of the child, merely by general impressions. Observations such as: "He was not given an intelligence test, but he seemed to be of about average intelligence," occur on several pages.

Experiments with a Backward Class: ELIZABETH A. TAYLOR. (Methuen, pp. 112, 6s.)

This book should be of great assistance to all teachers who have to deal with backward classes in primary schools, and more especially to those interested in the teaching of reading to such classes. The emotional conflicts that so often accompany extreme backwardness in reading are well brought out in a series of pen pictures of the individuals comprising the class. The year's work that is described is based on one of the varieties of the Project Method, but it is not so much on the account of the method employed that the value of the book depends, but rather on what is implicit in the whole account—the way in which the teacher takes advantage of the bond of sympathy which she establishes between herself and her children.

The book would have been improved by the inclusion of a table showing for each child his I.Q., and his reading age at the beginning and the end of the experiment. There is unfortunately a tendency not only to over emphasise the accuracy of the I.Q.—surely the quoting of an I.Q. of 96.95 is being, at least, over meticulous—but even some mis-interpretation. On page 14 we are told "This was a group bound together by the one characteristic of its prevailing mental dullness. Three boys only escaped this limitation (for even Edward with an I.Q. of 99.8 could be called only barely normal) . . ." In fact, there were eight boys with I.Q.s ranging from 90-118, seventeen with I.Q.s ranging from 76-86, and ten with I.Q.s below 75. The group cannot be classed as homogenous from the point of view of mental ability, as the author claims; any claim for homogeneity must lie in their degree of educational retardation. It is a pity that such an excellent book should be marred by such errors. B.B.W.

An Introduction to Experimental Psychology: C. W. VALENTINE. (University Tutorial Press, fourth edition, 286 pp., 5s.)

The value of this interesting and instructive introduction to experimental psychology is indicated by the fact that the demand for it has warranted a fourth edition. That it has been so continuously used by students of psychology is due in no small measure to its sound practical nature. The experiments, which can be carried out with a minimum of apparatus, enable students to gain in a clear, concise and practical way an understanding of mental processes. The book will be found very useful not only to students of psychology but to all training to be teachers.

In the new edition Professor Valentine has added some further material to the chapter on intelligence tests and, throughout, the book has been brought up to date by reference to recent publications.

One minor suggestion in respect to a further new edition is that short sections might be included on diagnostic tests and attitude tests which are now being increasingly used by students of psychology. F.J.S.

Know your Real Abilities: CHARLES V. and MARGARET E. BROADLEY. (McGraw Hill, pp. VII, plus 209, 16s. 6d.)

This book is based upon some years of research work in Johnson O'Connor's Human Engineering Laboratory in U.S.A., where over 18,000 persons are reported as being tested yearly. It makes, however, no pretence of being based upon precise estimates made as the result of psychological tests; indeed, the authors seem rather anxious to make it clear that they are not psychologists, though they have talked with others "who have taken aptitude tests."

Some of the "known aptitudes" appearing in their list will appear somewhat strange to psychologists, but there are many interesting records of individual people who have changed their work on the results of their experience and of advice given.

OTHER PUBLICATIONS RECEIVED.

The Eternal Question: FREDERICK JACOM SABEL. (Sabel Trading Co., Ltd., pp. 295, 9s. 6d.)

The Objective Method of Dream-Interpretation: MAJOR SATYA NÂND. (Northern India Printing and Publishing Co., pp. 251.)

Euclidean Geometry—Its Nature and Its Use: J. HERBERT BLACKHURST. (Garner Publishing Co., pp. 208.)

Facing Your Social Situation: JAMES F. WALSH. (Bruce Publishing Co., pp. 237, \$2.75.)

Die Psychologie Der Menschenbehandlung Im Betriebe: DR. FRANZISKA BAUMGARTEN (Rascher Verlag Zurich, pp. 304.)

Algebra: A. PAGE. (University of London Press, pp. 346, 18s. 0d.)

People—How to Know Them: MARTIN H. PERRY. (Sidgwick and Jackson, pp. 69, 6s. 0d.)

Plato's Theory of Education: R. C. LODGE. (Kegan Paul, pp. 322, 18s.)

The Psychology of Ego-involvements: M. SHERIF and H. CANTRIL. (Chapman and Hall, pp. 525, 36s.)

The Mixed Races of Burma: B. R. PEARN. (Lee Play House Press, pp. 8, 6d.)

The Indian in Burma: B. R. PEARN. (Le Play House Press, pp. 36, 2s. 6d.)

SYMPOSIUM ON THE SELECTION OF PUPILS FOR
DIFFERENT TYPES OF SECONDARY SCHOOLS.

V.—THE SELECTOR'S POINT OF VIEW.

By J. J. B. DEMPSTER

(Deputy Chief Education Officer, Southampton.)

I.—*The selector's point of view.* II.—*Measuring abilities and attainments (a) general intelligence ; (b) special abilities ; (c) attainment tests.* III.—*Teachers' reports.* IV.—*The assembling of results and selection.* V.—*Summary and conclusions.* VI.—*Appendix.*

I.—THE SELECTOR'S POINT OF VIEW.

IN the first contribution to this symposium Burt gave us an account of the ideals that should be before us in trying to solve this problem of selection for secondary education ; in the second Alexander spoke from the administrator's point of view, and joined swords with Burt over the potentialities of tests of group abilities as a means to guide selectors. In this contribution I wish to follow Burt's statement of ideals, and Alexander's administrative generalities, with some account of attempts that have been made in Burton-upon-Trent, and are being made in Southampton, to carry out a method of selection that draws its inspiration from the width of idealism but is shaped by administrative necessity. In other words, this is an account of some of the practical problems involved in selection. Although much that will be said will be dealt with from a general point of view, the problem of the use of objective tests for the measurement of abilities associated with general and technical education, respectively, will be dealt with in more detail.

Nobody to-day can fail to agree with Burt that selection cannot satisfactorily be carried out by a set of papers worked by candidates on one fateful day in their lives. As far as is possible, the full personality and setting of each child must be considered, but this ideal of individual study must be adjusted to meet the needs of a scheme of mass selection. Mass production in any educational matter is something we all deplore, but if we are to classify large numbers of children, keeping an even and fair standard throughout, then methods that can be applied to large numbers must be used. The adoption of group tests, although individual tests are agreed to give more satisfactory results, is an acknowledgment of administrative necessity. The application of mass testing in the forces, and the scientific manner in which many external examinations are conducted to-day, show how far we have developed the technique of mass selection. These techniques must be applied to selection for secondary education at 11 plus, but to facts derived from tests must be added information of a more individual nature that can only be obtained from close contact with the children themselves, by the only people that are in a position to obtain this, the teachers. This information must be presented in such a way that the findings of individual teachers can be compared one with another satisfactorily, and then combined with the test results to give a picture comprehensive and yet simple so that selectors can see clearly what their decision should be. The solution of the problem as a whole depends upon the solution of its parts, and these can be conveniently grouped for discussion under

three headings, testing, teachers' reports and the combination of all the relevant information in a form suitable for presentation to the selectors.

II.—MEASURING ABILITIES AND ATTAINMENTS.

(a) *General Intelligence*.—Since classification must be prognostic and not merely diagnostic the measurement of innate abilities occupies an important place in selection. Burt states his belief (page 60) "that general intelligence is certainly the most important factor at the age of 11 plus," and we have many tests that purport to measure this. It would seem a simple matter to select and use suitable tests, but there are many difficulties in practice. Most group tests of intelligence give adequate instruction for administration and can be objectively marked, but the manner in which the results are expressed are not always comparable. Thus whereas Moray House Standardised Scores have a standard deviation of 16, the intelligence quotients of suitable Catell tests (IIA and B) have no stated standard deviation, but a cursory glance at the distribution they give indicates a far wider range than the Moray House. If one is satisfied with one group test this may not matter much, but is one group test enough? If general intelligence is of such fundamental importance, its measurement must be made as accurately as is practicable, therefore a check is needed. The navigator must measure Greenwich Mean Time accurately to calculate his longitude, he carries three chronometers; we need three tests. The problem of the absentee is always with us, and it is, therefore, wise to set four tests and thus, in most cases, to obtain three results. In Burton-upon-Trent and in Southampton children work one intelligence test at 9 and 10 and two at 11, both verbal and non-verbal tests are included and all the results are considered when classification is attempted at 11 plus. In this way it is hoped to obtain as fair and true a measurement of general intelligence as is possible. In seeking and trying out tests for this programme it has become clear that there are not enough proved and trustworthy tests on the market. Since this is such an important tool for the selector it would seem that it would be a good service if somebody, such as the National Foundation of Educational Research, could make it part of its work to report upon such tests and be prepared to advise users about them.

(b) *Special Abilities*.—Burt believes (p. 60) that in addition to general intelligence, "different 'kinds' of intellectual ability, though admittedly less important, must be taken into account where possible," but he doubts whether the degree of individual difference in such specific abilities are sufficiently great to be measured at 11 plus. Alexander considers (p. 130) that "Certain specific aptitudes, notably academic aptitude, can be assessed with reasonable reliability. Technical aptitude can also be assessed with a sufficient degree of reliability, and in a sufficient number of cases to make allocation to technical courses of a type parallel to the course now provided in grammar schools a practicable procedure." It is not necessary to stress the importance of Alexander's contention if it is true, and it is because certain experiments carried out at Brighton and Burton-upon-Trent yielded results that contributed towards the solution of this problem that this matter is dealt with here in some detail.

(i) *The Brighton Experiment*.

The Brighton experiment¹ was undertaken in 1943 to attempt to describe and compare groups of grammar and modern school boys in terms of estimated

¹ J. J. B. DEMPSTER: An investigation into the use of estimated factor scores in describing and comparing groups of secondary and senior school boys of 11 plus. Unpublished thesis, University of London, 1944. Throughout this article "grammar" and "modern" have been used in place of "secondary" and "senior" to avoid confusion.

factor scores, and to see whether the comparison could give any guidance for the development of a suitable curriculum for the latter. Fifty-two grammar school boys and forty-three modern school boys, who had entered their respective schools four months earlier, were given a battery of twenty-eight tests designed to measure, among other things, verbal, reasoning, memory and spatial abilities. The latter group comprised the N.I.I.P. tests for Space Perception, Form Relations, Memory for Design and Tracing previously used by Shuttleworth¹ and others.

After analysis by the centroid method a general factor for the battery as a whole emerged before rotation, and factors associated with verbal, reasoning and spatial groups of tests were identified both before and after rotation.² No factor was found that was common to the memory tests but, unexpectedly, a fourth rotated factor that seemed to be associated with tests that required the examinee to make an "appraisal" was tentatively identified. Appraisal is used in the sense implied by J. Dewey in *How We Think* (p. 131) when he says, "Whenever we appraise, we both select and emphasize a particular quality or feature, and we link together things that, from the intellectual point of view, were previously separated." Regression equations for four tests in each group were then calculated by Aitken's method of pivotal condensation,³ and from these, scores for each child were estimated in each factor, both rotated and unrotated. From these estimated factor scores individual psychographs were prepared.

An examination of these psychographs showed at once that there were no clear cut "types" and that any classification must be based upon trends; one class merged into the next. The grammar and modern school boys were clearly divided by the general factor, but the estimated scores for the other factors gave a pattern that cut across both groups and suggested sub-divisions within them. The pattern made by the factors, both rotated and unrotated, for the group as a whole suggested the shape that these sub-divisions should take, but the sorting of the individual psychographs proved much more difficult than the factor pattern had indicated. This was due to a marked tendency towards even development of abilities as measured by estimated factor scores in a large number of children.⁴

Since this point has an important bearing upon the problem under discussion, it will be dealt with in some detail.

¹ C. W. SHUTTLEWORTH: Tests of Mechanical Aptitude considered as part of an entrance examination to a junior school. Unpublished thesis, University of London, 1941.

² All rotations referred to in this article were first decided graphically and then calculated as suggested by Thurstone, L. L., *Primary Mental Abilities*. (University of Chicago Press, 1938, p. 73 and p. 75.)

³ GODFREY H. THOMSON: *The Factorial Analysis of Human Ability*. (University of London Press, 1939, p. 89 *et seq.*)

⁴ This discussion must be considered against a background picture of the inter-correlation between the estimated factor scores for both rotated and unrotated factors. These are shown below.

Inter-correlation between estimated scores:

Factor	A.—Unrotated Factors.			
	I	II	III	
I	—	.232	.039	
II	.232	—	.282	
III	.039	.282	—	
Factor	B.—Rotated Factors.			
	I'	II'	III'	IV'
I'	—	.478	.419	.517
II'	.478	—	.560	.633
III'	.419	.560	—	.666
IV'	.517	.633	.666	—

(Footnote continued on next page.)

Although the tendency towards even development was present in both the grammar and the modern group it was most striking in the former.¹ Thus, taking $\cdot 5\sigma$ as a criterion, only 33 per cent. of the former showed an estimated score for one rotated factor exceeding the others, compared with 63 per cent. of the modern group. On the other hand, 36 per cent. of the grammar school boys showed two such scores standing out prominently compared with 10 per cent. of the modern school boys. Again 31 per cent. of the grammar school boys showed an all-round excellence, while only 25 per cent. of the modern school boys exhibited all-round ability of a lower order. To take another example, when estimated factor scores for rotated factors associated with verbal and spatial tests are compared, 46 per cent. of the grammar school boys show a difference between their scores of less than $\cdot 5\sigma$, but only 25 per cent. of the modern school boys. It must be stressed that similar results were obtained from the estimated factor scores from the unrotated factors.

From this it will be seen that, although the general picture given by the factor patterns seems to suggest a neat and useful sub-division using the scores from groups of tests that appear to be associated with certain abilities, yet, when this sorting is attempted, we find that a distinct tendency towards even profiles especially among the grammar school boys, makes the procedure less fruitful than was anticipated.

(ii) *The Burton Experiment.*

The second experiment carried out in Burton-upon-Trent in 1945-47 developed from the first. It was designed partly to act as a check upon the Brighton experiment, but mainly to see whether any emergence or growth of abilities could be deduced from the results of a battery of tests given to a complete age group of boys, at six monthly intervals between the ages of $11\frac{1}{2}$ and $13\frac{1}{2}$. This time the battery was limited to four tests of a verbal nature, four spatial tests (the same four as in the Brighton experiment), and verbal and non-verbal tests of general ability.

As before the results at each stage were analysed by the centroid method and estimated factor scores calculated. Upon each occasion the general factor for the

(Footnote continued.)

(The factors are those associated with tests that seem to have the following in common:

I General factor.	I' Reasoning.
II Abstract : Concrete.	II' Spatial.
III Reasoning : Appraisal.	III' Verbal.
	IV' Appraisal.)

A comparison between these tables illustrates Burt's statement on the effect of rotating axes. "This will mean, paradoxically enough, that, having begun with a set of correlated tests or traits, and having reduced them to terms of independent and uncorrelated components, we shall proceed to transform them still further into factors that are correlated and, therefore, mutually dependent." (Burt, C.: *The Factors of the Mind*. University of London Press, 1940, p. 236-7.) This would seem to be one of the disadvantages of rotation. Although Burt refers to factors and not estimated scores of factors, these tables clearly show that the result of the rotation of the axes has been to increase the correlation between the estimated factor scores also.

A more detailed discussion of this point will be found in the writer's M.A. thesis quoted above, p. 89-90 and Chapter VII.

¹ Bradford does not agree with this; he states that the size of the bias varies little between the duller and the brighter pupils, except in the case of the 15-16 mental age groups, which has lost many members to the grammar schools. (This *Journal*, Vol. XVIII, p. 77). Yet his 9-10 mental age group show rather more children with wide than narrow bias, and his 13-14 group more with narrow bias than wide. If we take his 15-16 group (and it is difficult to see why the loss of members of this group to the grammar school should affect the general issue), there are sixteen cases where the bias is less than $1\frac{1}{2}$ years of mental age and only six of four years or more. Table VI shows conflicting results. It is difficult to

battery was followed, first by a bipolar factor that seemed to differentiate between tests using more abstract material (verbal) and tests using more concrete material (non-verbal) and, then by a third factor, also bipolar, that seemed to contrast those tests that needed reasoning for their solution with those that could be solved by appraisal. Rotated factors common to verbal, spatial and reasoning tests were also obtained after each testing. The pattern remained constant throughout and neither the unrotated loadings of the tests nor their spread indicated any differential development in the ability of boys to handle the tests using verbal material compared with their ability to handle tests using spatial material. But there did seem to be both a divergence and an increase in the spread of the results when the tests associated with reasoning were compared with those needing appraisal only. The fact that development can be deduced in the latter case and not in the former, points to an important conclusion.

The abilities associated with verbal and spatial work seem to be maturing at comparable speeds during these years. This conflicts with the statement made by Burt and others that the ability associated with spatial tests either "emerges" after the age of 11 or matures more rapidly after that age and thus can be more easily measured at 13 than at 11.

It may be as well to describe here a smaller investigation that grew out of the main Burton-upon-Trent experiment. The factor associated with spatial tests that was identified in both these experiments seems to correspond with that el Koussy calls "k." Alexander says (p. 125) that "Drew seemed to establish that the 'F' factor and the 'k' factor were independent, and, further, confirmed that the 'F' factor was capable of measurement at the age of 11 plus whereas the 'k' factor did not appear to emerge until the age of 13 plus or later." The latter point has been dealt with above, and Price,¹ working with university students, and using a battery comprising both tests of general mental ability, performance tests of intelligence and form relations tests, aimed at investigating the relationship between "F" and "k." He found only two factors, one common to the whole of the battery and one other, instead of the three that might have been expected, if, in this case, Alexander's factor for performance tests and el Koussy's for spatial tests had been distinct. The minor investigation at Burton-upon-Trent was designed to explore this same problem with boys of 11 plus.

Ninety-one boys in their last year in the junior school were selected in such a way that their Intelligence Quotients formed a normal distribution. They were given a battery of tests including verbal and spatial tests, a non-verbal test of general mental ability and the tests forming Alexander's Performance Scale. Centroid analysis of the results yielded a general factor for the battery followed by a bipolar factor contrasting the verbal tests in the battery with both the spatial and the performance tests. A third factor could be interpreted as a comparison between reasoning and appraisal, two of the spatial tests being grouped with the performance tests. When these factors were rotated, two factors only emerged, one was very clearly verbal while with one exception, a circles test that was unreliable in any case, all the other tests, spatial and performance held closely together. This would appear to confirm Price's finding. If spatial and performance tests yield the same factor as this seems to imply, then they can be used as alternatives for prognostication. With this in mind let us return to the main Burton-upon-Trent experiment.

As stated above, estimated factor scores were calculated for each child for both rotated and unrotated factors, but this time two distinct sets of calculations were carried out for the unrotated factors.

¹ PRICE, E. J. L.: "The Nature of the Practical Factor (F)." (*Brit. Journ. Psy.*, XXX 1009)

It is possible to consider unrotated factors either as a whole or in two distinct parts. First the two tests at either extreme of the factor loadings were taken and their scores weighted and combined by means of regression equations to give one estimated factor score, called unrotated A ; then the four tests at either extreme were taken as two distinct groups and from each was estimated one factor score, called unrotated B. Thus there were three sets of estimated factor scores for each boy and the problem could be examined from each of these angles.

The factor pattern for both rotated and unrotated factors has been described above. After psychographs based upon the estimated factor scores had been drawn these were examined to discover, first of all, in how many cases each of the sets of scores enabled us to give worth while guidance. Taking those factors that distinguish between verbal tests that seem to be associated with academic ability, and spatial tests that seem to be associated with technical ability, the estimated factor scores for rotated factors were found to be least selective, those for unrotated A are more selective and those for unrotated B are most selective. Now, examining the results from successive testings to see how reliable the selections are, that is, how frequently the same boys had a score higher in one factor than another, we find that the reverse is true. The estimated scores from the rotated factors are most reliable, those from the unrotated A rather less reliable, while those from the unrotated B are least reliable. The final test is to combine these two and see in which cases the results are both selective and reliable, that is, in how many cases we can not only see what advice to give but would have given that same advice on each of the occasions when the tests were taken. This time the estimated scores from unrotated A show the greatest consistency, for, although only some 20 per cent. of the cases are sufficiently consistent to suggest that useful advice could be given, this is twice as many as are found for either of the others.

It would thus seem that the estimated factor scores derived from the bipolar factor taken in its entirety (unrotated A) is the most satisfactory for selection but that the number of boys who can be advised with a fair degree of certainty is only about one in five. It must be remembered once more that the boys who seemed definitely to have more ability either on the academic or the technical side or *vice versa* were also scattered throughout the whole range of mental ability. Thus only one boy in five who seemed on other accounts to be suitable for either a grammar or technical school education, could be advised which he should take. No helpful advice could be given to the other four. This may be because the tests themselves are not sufficiently reliable and possibly improved tests may give better results, but an examination of the profiles in both the Brighton and Burton experiments seems rather to indicate that it is more likely to be due to the large number of boys having fairly even potentialities in one direction or another, and that it is only in the comparatively few cases that striking bias is found.

One point that is taken up by Alexander in dealing with Burt's article has a very direct bearing on this. Burt suggests a correlation of .50 between "a grammar school test" and "a technical school test." Alexander quotes this as .6 and says that it is higher than he has found in his own work, and suggests .3 as being more accurate. An examination of the comparison between Moray House and Performance Scale test scores at the end of the Handbook published with the Alexander's Performance Scale show a correlation of .54 and an examination of the results shows that, if we take a criterion of .50 as being the minimum difference between scores upon which we could safely give guidance, then only 47 per cent. of the children tested could be advised. This corresponds very closely with the selectivity given by the estimated scores for the rotated factors in the Burton-upon-Trent experiment, and these were the least selective of the three types of scores used.

To sum up. These investigations seem to show :

- (i) That a factor associated with spatial tests that have been shown to be linked with success in technical education, can be measured in boys of 11 as well as it can in the same group of boys when they have become 13.
- (ii) This factor seems to be similar to that which is found to be associated with performance tests.
- (iii) Although this factor and others between them seem to promise useful possibilities in the division and sub-division of a group of children into sub-groups according to their abilities as measured by objective tests, yet when estimated factor scores are calculated for each child it is in only in a minority, often a small minority, of cases that guidance can be given or selection made with any degree of confidence. Under these circumstances it seems doubtful whether the use of spatial or performance tests as a guide for selection for grammar and technical school education are of very great value.¹

(c) *Attainment Tests.*—As soon as the testing of attainments is mentioned, two bogies raise their heads—the constriction of the junior school by the “scholarship examination,” and the dangers of “one fateful day.” Both of these are very real and need to be laid, but it would be unwise to do this by omitting attainment tests, and thus, in fact, avoiding the issue. The measurement of attainments can be faced squarely. If teachers are called into full consultation from the start it is possible to draw up an agreed statement of the ground the majority of children can reasonably be expected to cover in the junior school. This is a statement of minima, not maxima, and, in practice, there is little difficulty in finding common ground both among junior and secondary school heads concerning it. Once agreed, all attainment testing in the junior schools can be made to conform to it. Whatever examination pressure there now is bears upon the more thorough teaching of this minimum. There is no reason why bright children should not cover more ground if it is deemed desirable, but they do not improve their chances in the attainment tests thereby, for the attainment tests are geared to a thorough knowledge of the minimum laid down. Pressure thus becomes a good thing, not a bad, and the junior school teacher and child have time set free to develop along their own lines.

To lay the “fateful day” bogey we have found it best to measure each child’s attainments from two distinct angles. At the age of 9, 10 and 11 each child works two attainment tests. At first there were more of these, but by experience they have been cut down to mechanical arithmetic and reading for

¹ This apparent conflict between Bradford’s findings and my own turns upon the criteria that have been used to decide when there is sufficient bias to make guidance advisable. Like Bradford, I find promisingly low correlations between certain tests, yet when I come to individual estimated factor scores based upon these, the results are less helpful than might have been expected. My criterion of selectivity of $\cdot 5\sigma$ would give 8 points on a Moray House Test in English, Arithmetic or General Intelligence, and that seems a reasonable difference on which to work. Bradford takes two years of mental age, which at first glance one would consider sufficient, but it must depend upon the degree of spread of the raw scores on which the norms are based, and also, of course, upon the thoroughness of the testing itself.

It would seem to me, that Bradford is content with too few tests, and probably with too narrow a spread, and thus that his two years of mental age is rather less trustworthy than it first would appear to be. In other words, it may be that Bradford is taking for clear indication of bias, differences that are not sufficiently wide. Such a matter as this can only be put to the test by experiment to discover how much difference is needed to give reliable diagnosis.

comprehension. Each of the mechanical arithmetic tests is based upon the attainment agreed for that age. The second angle comes from a classification examination again based on the agreed attainments worked at 11. In Burton-upon-Trent this was set by an external examiner, but in Southampton Moray House Tests are being used since they conform very closely to the attainments required. Personally, I prefer the former arrangement since then the distribution of the results can be controlled to suit the needs of selection. This classification examination is taken in the children's own schools under their own teachers, and thus another objection, from the child's point of view, to the formality of the occasion, is removed.

III.—TEACHER'S REPORTS.

In order to make teachers' reports comparable one with another and to present the information in a compact form for educational guidance, some set form must be used. The series of record cards devised by the National Foundation of Educational Research is useful. Although the cards appear at first glance to be far too detailed, in practice they are not. There is a place for all relevant information, instructions for recording facts are readily accessible and clear, and, where quantitative estimates are needed, a reasonable degree of comparison is provided for by the use of a five-point scale. Yet there are very real difficulties in using the cards. Often in urban schools there are two or three parallel streams in each age group. It is fairly easy to find a way of combining teachers' estimates for school subjects for several groups, although usually this means falling back upon test results, but it is not so easy to ensure a normal distribution for personal qualities. Again, should each personal quality be assessed for each child? Teachers often do not know enough of each child to do this fairly and yet a partial distribution may be very misleading. What about staff changes? These must complicate this procedure if they are frequent. But apart from all these practical difficulties we do not yet know nearly enough about the reliance we can place upon teachers' estimates. Much more research is needed into this before we can feel sure of our ground. This again is of great importance if full weight is to be given, as most of us feel it should, to the consideration of the child as an individual and not merely as an intellect.

IV.—THE ASSEMBLING OF RESULTS AND SELECTION.

If many findings are to be brought together in making a final classification, they must be expressed in similar terms. The Moray House tests meet this difficulty by giving comparable quotients for Arithmetic, English and Intelligence, but it is difficult to see how other factors can be brought into line with this. In any case, the delicacy of the recording, spreading as it does over a scale of some 80 points, is perhaps misleading. Teachers cannot be expected to use more than a five-point scale to express personal qualities, and for this reason all findings used for selection by the writer have been reduced to this scale. The percentage distribution used on the N.F.E.R. Record Card has been retained, and, after age allowances have been made where necessary, cumulative frequencies are calculated and scores translated into grades comparable to the A, B, C, D, E, of the Record Card. This method brings with it one big difficulty. In order that distributions may be comparable, populations must coincide. Thus all children in the age group must take attainment tests, intelligence tests, and classification tests. This has not proved as formidable as it may seem at first sight to be and there have been compensations, both in the way in which testing then becomes an integral part of the school programme, and thus

stimulates the whole, and, as the corollary to this, the way in which the strain of the classification examination is reduced.

The expression of test results and teachers' reports in comparable terms is the first step towards their combination and comprehension.¹ This can be done by the addition of items to give a total, but it seems preferable to work by a comparison rather than by addition. First, where there are several results for one test or estimate, these can be combined. Thus the grades derived from the three or four intelligence quotients, grades from attainment tests and the grades given by teachers' estimates can each be combined to give one grade, with some added sign to show development if this seems necessary. Next, since there are now grades for attainment tests, classification tests and teachers' estimates for both Arithmetic and English, these can be allowed to check each other, giving a final grade for Arithmetic and English. The grade for English and Arithmetic can now be compared with the grade for General Intelligence and each child given a group label according to the pattern shown. This group label can be further modified by comparing it with grades for certain personal qualities that seem to be important, such as persistence and conscientiousness. In this way the children are classified into a number of groups. Where all the evidence points one way the classification is simple and the child falls into one or other of the main groups; where evidence is conflicting then new classifications develop between the main classifications. This system is flexible and yet mechanical. It can be modified to give extra weight to certain items if this seems advisable and, although it may seem more complicated than adding numbers, if all the work that is necessary to make distribution scores comparable is taken into consideration, and grading does away with this necessity, it will be seen that it is not too complicated in practice. Once the conventions to be used have been decided upon, the classification into groups is objective and mechanical. When classification has been completed, the picture as a whole can be examined and a threefold division made between the candidates; those that should certainly pass to grammar or technical secondary schools, those that should pass to secondary modern schools, and those whose cases should be further investigated.

The consideration of the border zone group takes us from mechanical objective selection to a more subjective consideration of individual cases. It is always possible to add to the facts already used for classification any new facts that seem necessary and can be graded for the purpose, but the most satisfactory solution, if the numbers are not too large, seems to be to place all the available information in the hands of three selectors and to let them examine it and give a ruling on each individual case. The unanimity of the three can then be used as a check on the decision. It is here that the interview comes, if at all. Superficial interviews are futile and misleading, and the technique of controlled interviews is not yet fully understood although progress is being made towards it, for example in Northumberland. At the moment I feel it is too uncertain and too time-consuming to be worth while. But whether interviews are used or not the selectors have ample information upon which to base their judgments.

The separation of the upper group into grammar and technical secondary school entrants, respectively, by tests of special aptitudes has been discussed fully already. I have tried to explain why I do not consider this satisfactory in practice, however promising it may sound in theory. Furthermore, at best it gives a reading for aptitudes only, and takes no account of interest, or, what is even more important, the child's social and economic setting and the influence

¹ A detailed example of this method is given in an Appendix.

this has upon the total situation. All this is summarized for us in the parent's wishes. The Education Act of 1944 states very clearly that parents' wishes must be consulted and this is where they can be most effectively used. First, they will exclude from the grammar-technical group certain children whom we should have included there, but whose parents wish them to proceed to secondary modern schools. Then they can guide us in the division of those that remain. A few figures may illustrate how effective this is. Only a handful of parents in Burton-upon-Trent failed to return the slip on which they were asked to record their wishes. Of those returned 39 per cent. wished their boys to pass to secondary modern schools, 29 per cent. to grammar schools, and 32 per cent. to secondary technical schools. The following year the percentages were 28 per cent., 30 per cent., and 42 per cent., respectively. In dividing the grammar-technical school group by parents' wishes, only 4 per cent. of the boys could not have their parents' first choice in the first year and 3 per cent. in the second. This area may be exceptional, I cannot say whether it is or not, but at any rate the results of using parents' wishes were encouraging.

Enough has been said to indicate the many problems that confront those who try to carry out selection and to suggest ways in which some of these can be solved. Future developments depend very largely upon the findings of research, but there is a general feeling that the more selection can be based upon teachers' reports the better it is likely to be. The degree to which these reports can be used depends, however, upon their reliability as compared one with another and the way in which the information they give can be combined with other information to give a true summary to the selectors.

V.—SUMMARY AND CONCLUSIONS.

1.—General Intelligence must be measured as accurately as possible; therefore, more than one test must be used and more reliable tests must be made available.

2.—Spatial and Performance tests seem to measure the same ability.

3.—The ability associated with spatial tests can be measured in boys as satisfactorily (or as unsatisfactorily) at 11 as at 13.

4.—In so few cases, especially among children with higher intelligence, do either spatial or performance tests indicate clear bias that their practical value in educational guidance is very limited.

5.—Examination pressure in the junior school and the "fateful day" atmosphere can be avoided by the adoption of agreed minimum attainments upon which tests must be based and the spreading of the tests over a longer period.

6.—Although seemingly suitable methods of recording teachers' reports have been devised, there are still many difficulties in their use, and much more needs to be known about the reliability of such records.

7.—One of the greater problems is the consolidation of information in a form suitable for selectors to work upon. This may probably be achieved most satisfactorily by reducing all the records that are amenable to such treatment to a five-point scale and then proceeding by a process of comparison to reach a final classification.

8.—It is better to consider borderline cases in a more personal manner, bringing in all available information, but not necessarily using an interview.

9.—The wishes of the parents are possibly the best guide at present available to selectors in deciding between grammar and technical school education.

APPENDIX.

The way in which a wide variety of information can be consolidated and used for selection was described in general terms above. An example of the application of these principles is set out here in more detail. With modifications this has been used for the last three years, first in Burton-upon-Trent, and then in Southampton, and has shown itself to be flexible and easily adapted to special circumstances. Judging by the opinions of both the Junior schools from which the candidates were drawn and the secondary schools of various types that received them, it has selected the right children.

To reach the stage where there is a division into grammar and/or technical secondary school entrants on the one hand, and secondary modern school entrants on the other, there are nine steps.

1.—Information is collected from :

- (i) Examinations in English and Arithmetic either in the form of standardised tests (e.g., Moray House) or papers set by external examiners.
- (ii) Intelligence tests, verbal and non-verbal, taken at 9, 10 and 11 years of age (two in the latter year).
- (iii) Attainment Tests in mechanical arithmetic and reading for comprehension taken at 9, 10 and 11.
- (iv) Teachers' estimates of ability in English and Arithmetic at 9, 10 and 11.

2.—All results, after age allowances have been made, are expressed in grades using the distribution A : 5 per cent. ; B : 25 per cent. ; C : 40 per cent. ; D : 25 per cent. ; E : 5 per cent. ; to correspond with the grades used for Teachers' estimates and other information on the N.F.E.R. record card.

3.—These results are then collected on summary sheets but—

- (i) Since there is no need later for so fine a grading as 5 per cent. for the top group, the five grades are reduced to three thus :

$$\begin{array}{lcl} \text{A :} & 5\% & \\ \text{B :} & 25\% & \} = 30\% = \text{G.} \\ \text{C :} & & = 40\% = \text{H.} \\ \text{D :} & 25\% & \\ \text{E :} & 5\% & \} = 30\% = \text{J.} \end{array}$$

It may seem waste of time to reduce thus from five to three grades instead of using three grades only from the beginning, but the finer grading is used for other purposes.

- (ii) In some cases several results have to be combined ; thus we have four I.Q.'s. expressed in A—E grades. A final Intelligence grade on the three point scale is derived from these by inspection. Thus A, A, B, A, becomes G ; A, C, B, A, becomes G ; B, D, E, D, becomes J. There is usually little difficulty about this for although there may be occasionally one result widely at variance with the others this can easily be detected and ignored.

4.—The summary of the final results is then considered.

Name.	Exam. Result		Gen. Int.	Cat. I	Att. Tests.		Tests Est.		Cat. II	Cat. III
	Eng.	Arith.			Eng.	Arith.	Eng.	Arith.		
T. Smith ..	G	G	G	X	G	G	G	G	X	X
J. Jones ..	G	H	H	Z	G	G	G	G	X	Z++
R. Brown ..	H	G	G	Y	H	J	H	J	O	Y--
P. Green ..	H	J	J	O	G	H	J	H	Z	O+

The Examination results and the grade for the I.Q. are grouped together to form Category I and this is the basis. Attainment test results and teachers' estimates are grouped to form Category II. This is used to modify

Category I, thus giving Category III. The grouping of attainment tests and teachers' estimates is arbitrary and other combinations are being tried. However, it is convenient and it appears to give satisfactory results.

Category I is formed from the grades derived from the English and Arithmetic examination results and the I.Q. thus :

Three G's = X
Two G's = Y
One G = Z
No G's = O

Category II is formed in the same way from attainment test results and teachers' estimates, but there are four grades to combine :

Four or three G's = X
Two G's = Y
One G = Z
No G's = O

Category III is based upon Category I, modifications by Category II being shown by pluses and minuses, thus :

Cat. I	Cat. II	Cat. III
X	X	X
X	Y	X-
Y	X	Y+
X	Z	X-- etc.

5.—The groupings under Category III are then examined to decide where the upper and lower limits of the border zone should be drawn. Below is a typical grouping :

X	123	Z++	10
X-	21	Z+	5
X--	5	Z	56
X---	2	Z-	48
Y+	28	O++++	2
Y	73	O++	5
Y-	15	O+	15
Y--	3	O	735

300 places have to be filled. Here is a suggested combination of categories to give this :

- (i) X, X-, Y+, Y, Y- added together give 260 and it seems reasonable to accept these at once.
- (ii) (a) X--, X---, Y-- gives 10. These are more highly recommended by the examination than by the attainment tests and teachers' estimates.
- (b) Z++, Z+, O++++, O++ gives 22. These are more highly recommended by the attainment tests and teachers' estimates than by the examination.
- (c) Z gives 56. These just rise to the top 30 per cent. in one grade in each category.

Together these give a border zone of 88 from which 40 must be selected.

6.—As explained elsewhere the candidates in this border zone are then considered as individuals by independent assessors using the information already on the summary sheets to which has been added all the remainder of the information on the record cards, the Heads Order of Merit, and the result of a test in written expression.

7.—The findings of the assessors are then drawn together by a chief assessor and a final decision reached in each case.

The advantages of this method of selection are that :

- (1) Teachers' estimates, that can only be expressed in comparatively coarse grades, can be combined with other information.

- (2) Comparable information from different sources can be easily checked. Thus the grades for Arithmetic from examination, attainment tests and teachers' estimates can be compared at a glance.
- (3) Whereas the marks added to form the usual order of merit list bunch as the average is approached and make it difficult to differentiate between candidates in the border zone, this method spreads the candidates round the critical point into a number of groups.
- (4) The whole system can be modified in its gradings or its groupings for categories to suit any special needs.

Two points need special emphasis. So that the grades may be comparable the same population must be used throughout. Thus if teachers' estimates are based on the whole age group, then the whole age group must be used for examination and attainment tests. This has its disadvantages but also its advantages. Secondly, in order to obtain the best scatter of categories round the border line the top grade used should correspond roughly to the percentage of children that will be selected. Above, where $G=30$ per cent. is used, it is implied that about 30 per cent. will be selected; if 20 per cent. only were required, then $G=20$ per cent. must be used. This is a rough guide only; thus if 23 per cent. were required, $G=25$ per cent. would be quite near enough.

SOME PRESENT-DAY TRENDS, DANGERS, AND POSSIBILITIES IN THE FIELD OF PSYCHOLOGY.

(PRESIDENTIAL ADDRESS TO THE BRITISH PSYCHOLOGICAL
SOCIETY.)¹

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I.—*Some present-day trends.* II.—*Popularisation and its dangers.* III.—*Some possibilities.*

I.—SOME PRESENT-DAY TRENDS.

A SURVEY of some present-day aspects of psychology in this country seems not unsuitable for a presidential address at a time like this, when public interest in the applications of psychology is developing so rapidly, and when our Society is increasing so much in influence. As this conference includes a large number of visitors, I propose to make my survey as non-technical as possible.

I should like to begin by a contrast with times gone by; and unlike most elderly gentlemen commenting on the "good old times," I wish to strike first an optimistic note. If we glance at the position of psychology at the beginning of this century, we must be cheered and even amazed, to see what advance has been made, within one generation, and in spite of much scepticism and even opposition in early days from philosophers, doctors, clergy and teachers.

Nearly fifty years ago, when I began the study of psychology, there were no chairs of psychology in this country, except one in London. In that year of 1900 my own first teacher of psychology, a professor of philosophy, was regarded somewhat as a crank because he introduced into the lecture room a few pieces of psychological apparatus, the use of which he himself did not properly understand.

Even in 1907, at Cambridge, our teacher in general psychology in the first year was primarily a logician. Our main text books were still Stout and Ward. (I should like to interpolate here, however, that those of us who were brought up on Stout—a strong, though not a heady brew—must ever remain grateful for his masterly precision of language, and his never shirking a difficulty. We were never liable to the illusion, all too common to-day, that psychology was a soft option or that we could rapidly get practical tips for teaching or psychological formulæ for social reform, without hard and prolonged study.)

At Cambridge in 1908, it was first permitted to take part II of the Moral Sciences Tripos in Psychology alone. All our practical work had to be done in a little cottage; but as we had as tutors those pioneer, yet critical, psychologists, C. S. Myers and W. H. R. Rivers, we learned once and for all how much more important is the teacher, than are buildings or apparatus.

And now, within a man's working life-time, how things are changed. Eleven independent chairs of psychology are established in the universities, and even the University of Oxford has recently fallen in the general advance.

A still more striking sign of change is the *growth of practical applications of psychology*, almost unknown at the beginning of the century.

¹ Delivered at the Annual Conference of the Society at Birmingham, April, 1948.

The topics prominent in the minds of the psychologists of that period are shown by the first published papers of five recent presidents of this Society, then young beginners, four of us here to-day. They were as follow :

J. C. Flugel—in conjunction with McDougall—" Observations on the variation of the intensity of visual sensation with the duration of the stimulus."

T. H. Pear (working under Myers), " The experimental examination of some differences between the major and the minor chord."

Godfrey Thomson (under Myers), " A comparison of psychophysical methods—as applied to measuring the cutaneous spatial threshold."

Myself—" Psychological theories of the horizontal-vertical illusion," on which I recorded nearly 20,000 judgments (half of them made in a dark room by long suffering subjects), only to find that Rivers thought I should continue with further experiments !

You will note the preoccupation of all these researches with sensory and perceptual phenomena. Only in Burt's first publication do we get a hint of future practical applications, his first work (under McDougall) being " Experimental tests of general intelligence," and some of those tests were of a sensory nature.

And now, what a difference is shown in present trends. The amount of research on psychological topics directly bearing on practical problems far exceeds that on what is usually called the ' pure ' science. To select only one practical application—the use of intelligence tests in selecting children for secondary schools ; this was almost unknown even up to twenty years ago. Now it is sometimes the task of the psychologists to restrain the unbounded faith of some laymen in intelligence tests ; the local educational authorities cannot find all the educational psychologists they want, and one grave danger is that inadequately trained persons may be appointed, to the detriment of the later reputation of psychology.

I have mentioned research in the practical application of psychology as a sign of advance ; but that does not imply that there is no room for research into problems of more academic interest. Here I touch on a topic keenly debated at the last meeting of the Society in Birmingham. Some of those present, including Kurt Koffka, argued that we should concentrate on laboratory work until we have built up a coherent body of scientific psychology ; and that we did not know enough yet to tackle wider social problems. Against this the view that we should give our energies to problems of immediate practical importance was vigorously proclaimed by Professor Pear, not only in both the major and minor keys, but often with the loud pedal down ! A similar clash of ideas has appeared in meetings of our Society in more recent years.

Surely we need both types of investigation. We should, it seems to me, approach our problems from both ends—like engineers cutting a long tunnel even though we cannot expect to meet so precisely in the middle. Let us grant that psychology, *qua* science, is primarily concerned with the discovery of truth, whatever it may be. The true psychologist should indeed love his work for its own sake. Ideally, one who is to be a genuine psychologist should have strong enough curiosity about human nature to be willing to investigate some problem of apparently no practical importance, if no more useful one is at hand. Should we not encourage such to follow up the topic that interests him most ? Possibly, indeed, it may prove in the long run of as great a practical value as the work of some who attack the practical problems directly.

But having granted that, let us recall that psychologists are also human beings (though that may surprise some people) and most of us are eager to see our work helping some great purpose. Some of us, of whom I confess I am now one, feel that we must concentrate on such work.

To the purist who says we should only seek truth for its own sake, whether useful or not, there is always the reply, made long ago by William James among others, that the pure scientist's search for truth, itself implies a judgment of value, the supreme value of truth—itself an unproved assumption.

Nevertheless, a warning must be sounded. There is a grave danger that if we are deeply concerned about some practical problem, if we hold strong views, social, political, religious or anti-religious, we may be biased in judgment on some psychological questions which are still largely matters of opinion, and in which one can even unconsciously select chiefly the evidence *for* the view we cherish. This danger is greatest for beginners, but not confined to them. More than once I and my editorial colleagues have had to send back articles submitted for publication, even by psychologists of some repute, because the authors, in drawing conclusions, seemed blind to some of the evidence of their own findings, which clearly contradicted some of their statements.

Now if it appeared that psychologists in their speeches or writings were allowing personal bias to affect their psychological impartiality, they would do harm not only to their own reputations, but to that of psychology itself, and to our Society if they are members.

Herein lies the value of our custom that contributions on controversial topics are first submitted to the criticism of other psychologists—in our own meetings or journals. Of course, our Society does not impose any limit to freedom in the expression of psychological views, however unorthodox. It may be peculiarly appropriate here in the Bishopric of Birmingham, to say that no President of the Society is likely to declare that the author of any book on psychology is so heterodox that he ought to resign from the Society. When the Society decided to open its doors to all interested in psychology, it opened them very wide indeed. The Articles of Association of the Society on this point are both quaint and significant. They specify that the Society may terminate the membership of one who "shall be adjudicated bankrupt, or convicted of a felony or any other criminal offence, or is found lunatic or becomes of unsound mind"! And even then it is only stipulated that the Society "*may*" eject such members, not "*shall*"—which perhaps accounts for any apparent exceptions which may occur to some of you.

But our custom of open discussion on points of difference is apt to have one unfortunate effect. Many observers may get the impression that psychologists are largely occupied in contradicting one another. For if one of them presents a paper it is often to expound some new point of view—something in which he differs from others. Points of agreement need not be stressed or even mentioned.

For example, in the JOURNAL I have the honour to edit, there is just now being published a symposium on the selection of pupils for secondary schools. In the first two articles by Sir Cyril Burt and Dr. W. P. Alexander, the prominent thing is Alexander's view that we *can* select at eleven years of age, pupils specially fitted for the technical high school, rather than the grammar school. Burt maintains that we cannot, with rare exceptions. The average layman is apt to comment, "These psychologists never agree." To him there do not appear the much more important points on which all contributors to our symposium would agree, including the great value of tests of general intelligence in this selection, the need of specific abilities for the technical as against the grammar school, and the value of tests for these specific abilities. The difference of

opinion is almost solely as to whether such specific tests can be usefully applied at eleven or not until twelve or thirteen.

Similarly Spearman and Godfrey Thomson disputed vigorously for years about general ability; but the difference was primarily, if not entirely, about whether one general factor was decisively proved. The body of psychological doctrine on which they agreed was vastly greater than that on which they differed.

Again Professor Allport's able book on *Personality*, in which he laid so much stress on habit and 'functional autonomy,' gave the general impression that he had abandoned all belief in innate tendencies. But you will find in his book this notable statement: "Temperament is dependent upon constitutional make-up, and therefore largely hereditary in origin;" and "temperament," he says, "includes a man's susceptibility to emotional stimulation," his "customary strength and speed of response."¹ This surely approaches much nearer than some supporters of Allport recognise to the dominant views in this country as to innate propensities.

The fact is that in books, as well as in papers, psychologists naturally tend to stress their own differentiating views, and so the many points of agreement are apt to be overlooked.

The idea that psychologists have no common basis of agreement has been spread chiefly through the popularisation of medical psychology and by those amateurs who know only of Freud, Adler and Jung, but nothing of that vast body of experimentally or statistically established facts, in reference to less exciting but essential topics. Exaggerated ideas as to complete divergence of views among psychologists have been encouraged especially by the emphasis by leaders of special 'schools' of thought on their own special contributions; not only the schools represented by the names of Freud, Jung and Adler, but by advocates of Behaviourism, Gestalt Psychology, Reflexology, and so on. It is notable that such 'schools' found their origin almost entirely abroad, and on this point I should like to quote some comments of a foreign observer, Dr. Wagner Smitt, of the Danish National Society for Mental Health. He writes of the individualism and intolerance of continental and especially German psychologists, and suggests they should be combated by stressing team work, in which he thinks Anglo-Saxon investigators have led the way and are superior to their continental colleagues.² I think we may accept this outside impartial view of British psychologists as sound, and not due, as a cynic might suggest, to lack of originality among British psychologists. Certainly we have evidence of team work in this country, in several recent books by groups of authors, and in our numerous symposia.

But in view of the spread of the general interest in psychology, I suggest that one great need of the present day is an authoritative volume, by a representative team, on general psychology as expounded in this country, concentrating largely on points of general agreement, while stating plainly matters on which there is substantial disagreement. I do not envy the editor of such a book; and the study of it might not be easy; but the idea that psychology is an easy subject is illusory and pernicious. Those who have not been through a systematic course in psychology should not cherish the idea that they can pick it up by reading journal articles or hearing discussions on disconnected topics. Indeed, one might say paradoxically that one cannot study one aspect of the science properly until one has studied them *all*.

¹ *Personality: A psychological interpretation*, p. 54.

² These comments are taken from the London International Congress of Mental Health, *Bulletin* No. 5, Dec., 1947.

II.—POPULARISATION AND ITS DANGERS.

The popular demand for easy snippets has been increased by the remarkable recent expansion of interest in psychology, brought about especially by its practical applications to problems of mental health, education, vocational guidance, and in the fighting services. Psychologists are now constantly being asked to give short talks on psychology to various types of societies—perhaps on "The psychology of the unconscious," to the clergy, or to parents on "Psychology and discipline."

Now I must speak with caution here, for I have to confess to giving short broadcast talks on psychological topics. I agree that brief introductory talks may have their uses if at the same time they indicate their limitations, and encourage further serious study. Most of all they are useful for destroying popular illusions. "A little learning" need not be a dangerous thing, if the learner is led to realise that it is only a little. And we should, I think, take a realist attitude and recognise the plain fact, that if qualified psychologists do not provide elementary expositions of psychology to the public, they will get it from unqualified persons and perhaps unscrupulous charlatans.

A special danger arises when a person, after superficial studies applies them in other spheres in which he may speak with some authority—whether on social affairs or on questions of mental health, education, literary criticism, or the training of children in the family, where misunderstandings of brief accounts of Freud's doctrine as to repression have led to some absurd ideas about the need to avoid all restraint and discipline in the upbringing of children.

Still with all its dangers, the gains of popularisation should be greater than the losses, if the exposition is sound and critical, and if the practical applications are made with moderation. We know how great an influence public opinion has on educational and social reform, and on international relations; and such public opinion is so often intermingled with psychological ideas, sometimes by chance sound but often unwarranted, for example, that war is inevitable because of man's instinct of pugnacity. Sometimes these popular psychological ideas were long ago refuted; for example, the doctrine of 'formal training,' the general transference of effects of special training, is still held in its extreme form by many teachers in schools and universities, witness some of the recent arguments for the retention of compulsory Latin for admission to Cambridge.

In many aspects of every day life some knowledge of psychology could help. I have found parents, even teachers, very anxious about their own children of two or three years because they were becoming rebellious—the parents being quite ignorant of the fact that a period of resistance about that age has been shown to be actually a healthy sign.

Many adolescents endure profound depressions which could be lightened if they knew how common such experiences are and how transient.

Some marriages are on the verge of disruption through ignorance of the most elementary psychology of sex relationships. Some people I have found greatly worried about what they miscall their 'inferiority complex,' when it is only a becoming, and perhaps appropriate, modesty.

Again, the possibility of the unconscious influence of personal motives on political views needs to be brought home to all citizens.

Some psychological investigations bearing on social and economic progress ought to be more widely known. For example some ardent social reformers, denouncing the monotony of routine work and demanding greater responsibility for workers, are unaware that enquiries have shown that a good many people actually prefer routine work, and some would rather have a lower wage than

shoulder responsibility. It is never safe to assume that what seems plain common-sense to us, is sure to be supported by investigation; I confess to having argued that industry should try to enlist more married women workers by part-time work in the middle of the day while children were at school and husbands at work. It seemed obvious that this would be the most convenient and popular arrangement for the wives. But a recent report in the *Manchester Guardian* runs as follows: "A number of firms managed to increase production still further by organizing (for women) an evening shift from 6-0 p.m. to 10-0 on five nights per week. This shift is proving very popular amongst married women whose husbands are *at home* in the evening!"

Again one is constantly brought up sharply by ignorance among parents of elementary facts as to innate differences in mental ability. Some parents simply cannot believe that one of their own children may be innately dull and unable to emulate the achievements of father or elder brother; and it is unfair to expect the teacher or the psychologist called in to treat the child, to be the first to inform the parents of the main facts as to individual differences.

Such ignorance may be found even in well-educated parents. For example, one of such recently brought his eighteen-year-old daughter to me for advice about difficulties in reading. She was a pleasant and sociable girl, and in a large private school she had been pushed up finally into one of the Senior classes. Yet her I.Q. I found to be only about 90, and her reading quotient even lower; she made mistakes in reading words usually assigned to the age of seven. Her arithmetic was even worse; though she was studying stocks and shares, she was uncertain on multiplication tables, and simple fractions. It was another example of the familiar fact that a child's progress may be made worse than it need be by work beyond his capacity. The father was told that the girl must be started in reading and arithmetic from the beginning. Expert coaching brought her along very well for a time, but it was eventually spoiled by the father's strong conviction that more advanced work would increase the rate of progress. The father attempted this at home, and the girl at once showed confusion and retrogression. Our educational psychologists could give many such examples in which parents' ignorance as to elementary psychological facts, or worse, their strong belief in erroneous ideas, have made proper treatment much harder.

In our local press recently parents have protested against a child being placed in a C class on the grounds that it did not give him the same chance as those who were in the A or B stream; they were completely unaware of the fact that a child is placed in a C class precisely in order to give him the best chance of progress.

Even some teachers still allow too little for individual differences. Children are pushed up to higher classes on the ground of age; lack of progress is sometimes attributed too readily to the child's not doing his best. Even a child's poor performance in an intelligence test is sometimes taken by a teacher as a reflection on her own teaching.

The *Norwood Report* itself in some passages tends to suggest that most children are pretty well equal as to the value of their mental abilities, though these may take different forms; hence the suggestion that the modern secondary school, though containing all the innately dull, and in many small towns and rural districts actually mental defectives, should be regarded as equal in prestige to the grammar school or technical high school. Equal in importance, yes; and needing as able, perhaps even abler teachers. But so long at least as the process of selecting pupils for the grammar schools or technical high schools

on the basis of higher general ability continues, the modern school cannot be expected to produce equally good results.

At the back of some of these suppositions there usually lies the belief that apart from a few mental defectives and a few geniuses, all children are practically of the same degree of intelligence; and that anything could be made of any child provided he had the right education. Dr. Flugel in a recent enquiry as to popular ideas about intelligence, found that out of his 300 subjects, about one in five thought that *any* child should be able to go to any school or university he chose without any entrance examination or intelligence test.¹ In the U.S.A. even among some 140 medical students, nearly one in three thought that any child, if properly trained from birth, could be made into a successful doctor, lawyer, engineer or journalist.²

All this widespread ignorance as to psychological facts is paralleled by *misapprehension about the nature of psychology itself*, and again this is to be found in all quarters—not excluding the Brains' Trust or even the universities. The confusion of psychology with psychical research or with psycho-analysis is of course still common. My son was recently asked by another university student, what he was studying; "Psychology," was the reply; "Oh," said the other student, "that's sex and the Œdipus complex, isn't it?" Many people, especially medical men and others who have dabbled only in abnormal psychology, think that it began with Freud and ended with Adler or Jung. I once heard the chief medical officer of a great city, clearly under that illusion, and antagonised by Freud's emphasis on sex, declare that Adler was the man who had first brought sanity into psychology!

Such restricted knowledge and obsession with the abnormal, encourage the widespread idea that psychology is a matter largely for the medical man and not merely when it concerns possible insanity, or the influence of bodily conditions on mental processes, but in questions of every-day human behaviour, and especially of children's conduct and training. Thus you find our popular Radio Doctor in the middle of answering questions from mothers about teething and digestion, dealing with one in which a mother asked if her gentler treatment of a difficult child was right, or the father's stricter discipline; the Radio Doctor settled that in a few sentences and plumped for the mother. Incidentally, there was little or nothing about individual child differences, or consistency and degrees of strictness or indulgence; but my main point at the moment is that the parent thought it was a question that a doctor was the one to deal with. Now we may readily agree that family doctors, with their intimate knowledge of many homes, have a better basis for advice on *some* problems of family adjustment than men in most other professions. Still, even our medical colleagues in this Society will agree that this idea that a doctor, untrained in psychology, is necessarily competent, because he is a doctor, to deal with problems of conduct or training is quite unjustifiable.

Another example bearing on this point is a recent circular of the Ministry of Education. This decreed that the medical officer who certifies a child as 'educationally subnormal,' must himself have carried out the intelligence testing. Even if he had as a colleague a psychologist with a thorough training and experience in testing the doctor must not rely on her results even if he wished to. Such a regulation would permit a doctor with little training or experience in testing to apply the intelligence tests, but would rule out as incompetent Sir Cyril Burt or Professor Schonell. (I may add that a letter from

¹See his article in this *Journal*, Vol. 17, 1947.

²See article by L. L. Raley in this *Journal*, Vol. 15, 1945.

the Council of this Society has obtained a promise from the Minister of Education that the circular shall be reconsidered.)

In the rapid spread of the popularity of psychology lies another danger ; that the *teaching of the subject* may be entrusted to unqualified persons. That has been a danger in some W.E.A. and other organisations, though in some centres I know matters have greatly improved. Elsewhere the danger is still greater. For example a teacher of biology was recently appointed by an important technical college. She had studied no psychology since her Education Dipoma course, some twenty years before. Yet one of her immediate duties was to lecture on the psychology of childhood, from birth to adolescence, and in the following year to give a course on general psychology. Her first step was to write to ask me to suggest an introductory text-book for herself to study !

In view of the great demand for university extra-mural and W.E.A. lectures in psychology, some facts as to the motives for such studies may be of interest. They were gathered by two colleagues in Birmingham University. Among 190 students attending courses in various parts of the country, (85 men and 105 women). Of these, about one quarter said their interest in psychology had first been roused by reading a book ; about one-fifth through the interest of a friend ; rather more than one in ten by lectures, and rather less than one in ten by broadcasts.

As to motives for taking the course, over one-quarter were taking psychology for vocational purposes ; but, the most frequent motive was its supposed 'practical use' : e.g., "Psychology may help me to solve a personal problem," or "I want to understand other people," or again, "to influence other people." It is notable that this motive was especially frequent among women over forty.¹

Now if we are to secure the spreading of a sound knowledge of psychology and of unexaggerated views as to its present values ; if we are to combat the absurd ideas about the nature of psychology and make clear the need for serious study, then some experts must take an active share in this popularisation. I agree with Professor Pear's view that in the past at least, some professors and lecturers in psychology have felt it below their dignity to write popular books or newspaper articles. But I think this self-restraint is much less than it was, and generally now it is a question of lack of time and the claims of teaching research and administrative duties. Also, not all scholars have a gift for popularisation.

Certainly if it is to be done effectively, we must avoid unnecessary use of *technical terms*, and aim at clarity and simplicity. This itself has its dangers. Clarity is sometimes mistaken for superficiality, and obscurity for profundity. A great preacher once advised his young student-preachers to include in every sermon at least one passage which no one could understand ; and I am taking risks in making this address intelligible even to our non-psychological visitors. Perhaps I may correct that error later.

If, however, the gradual popularisation of psychology is desirable, difficulties are bound to occur in connection with the use of technical terms. We are constantly accused of using 'psychological jargon.' Why, people ask, cannot psychologists write so that everyone can understand ? These criticisms are made sometimes by scholars in other sciences who constantly use terms and symbols comprehensible only to themselves. Yet they expect to understand at once psychological literature, though they have not studied it, because it deals with common experiences normally described by terms such as desire, memory, emotions, etc., in everyday use.

But it is precisely because psychology has advanced beyond every-day knowledge that it needs certain technical terms to express its findings, and to

¹ See article by W. E. Flood and R. W. Crossland, this *Journal*, Vol. 18 (Part II), 1948.

save unnecessary circumlocutions. No words in everyday use can do for the psychologist in the place of conation; affective; orectic; various terms and symbols in connection with general and special abilities and their measurement, and that series of terms which our increased knowledge of unconscious processes has required—projection, rationalization, and so on; we do not use technical terms simply to prevent the uninitiated from entering into our secret knowledge.

But having said so much in defence of technical terms, I would repeat the plea for clarity and simplicity, so far as these are possible, and for the avoidance of unnecessary technical terms, and for the brief explanation of unavoidable technical terms, except in articles intended solely for experts.

Perhaps the greatest danger of all is that of *incompetence and even charlatanism in the field of mental health*. At present, anyone can set up a brass plate labelling himself "Consulting Psychologist." In the press one can read advertisements by persons giving no credentials, offering psychological consultations at several guineas a time.

Eventually, I believe the difficult problem of the qualifications needed for psychological treatment and possibly even the right to the label 'psychologist,' will have to be faced by this Society, with the co-operation of course of our psychiatric colleagues and of the Universities and perhaps of the B.M.A. and/or the Ministry of Health.

III.—SOME POSSIBILITIES.

Now let us turn to my last topic—some possibilities in the field of psychology. I can only touch on a few of these, in which my own main interests lie, namely in reference to childhood, mental health and education, while recognizing the equal importance of others, as in the borderline between physiology and psychology, in its application in the services and in the selection of personnel, in industrial psychology and vocational guidance, in the social psychology of groups and of international relations; and in the study of problems of heredity and national intelligence. On the last point I should like at least to mention the possibility of new and decisive evidence from the Scottish Survey under Professor Godfrey Thomson on the serious decline in the average intelligence of the population owing to the higher birth rate in the less intelligent families. To my mind the existing evidence of such a decline is already convincing, and the future decline is likely to be still more serious for two reasons: First, because we are selecting by the entrance examinations for grammar schools the most intelligent children from the lower economic levels; many of these will tend to take up some profession or 'black-coated' occupation and adopt the middle class custom of later marriage and small families; so that we are slowly draining the lower levels of their ablest members. Secondly, the increased tendency for ablest girls to obtain well paid jobs will, on the whole, tend to lead more of the ablest to refrain from marriages which would mean an economic drop, so that the mothers of future generations will include a smaller proportion of the ablest girls.¹

In the field of *mental health* we find more hopeful signs. We are all agreed that preventive measures are better than later cures, and first the extension of nursery schools will give increasing opportunities for educational psychologists and psychologically trained teachers to get into closer contact with parents and so lessen, though they can never eradicate, the influence of any bad home training.

¹For surveys of the existing evidence, see *Intelligence and Fertility* by Sir Cyril Burt, and *The Trend of National Intelligence* by Godfrey Thomson, both publications of the Eugenics Society (Hamish Hamilton, 2s. 0d. each).

Before many years pass most local authorities will have their own educational psychologist to help teachers in the testing and remedial teaching of backward children, in the wiser handling of difficult ones (or of the very bright), in making school reports and in the selection for different types of secondary schools. All this work will be made more possible by the gradual increase in the number of teachers who have had a sound, if brief, training in psychology.

With this steady increase of enlightened teachers, it will be more possible to make use of internal school records. Right away, I think we could get rid of the competitive examination for places in grammar schools and the pernicious cramming for it in the homes, or the hurrying forward of children in the junior and even infant schools. This could be done I suggest by a scheme I proposed some years ago,¹ and which has recently been put into effect in Walsall. It uses intelligence tests, and internal school reports, and yet avoids the supreme difficulty of comparing the reports of one head master with those of others with very different standards.

The plan is first to ascertain the number of vacancies in the grammar schools of the town; then to discover the number of bright pupils in each junior school by means of two or better, three, intelligence tests. These tests will also show us the lowest I.Q. which we have to accept to fill the vacancies. Then each Junior school is given its quota of grammar school places according to its proportion of bright pupils. The head of each Junior school, *before* he knows the results of the tests, makes, with the co-operation of class teachers, an estimate of his pupils, taking into consideration, if desired, the results of his own internal examination. His order of merit is then blended with that in the intelligence tests, and the boys who now come out top in their own school on the average of the two orders, are awarded the places in the grammar school up to the number of that junior school's quota.

The Director of Education for Walsall, Mr. V. J. Moore, had the initiative to introduce this plan some years ago (the number of enlightened Directors of Education is also increasing), and the heads of all the schools—secondary and primary—have voted for its continuance each year since. At Walsall each primary school also has its own internal examination which gives a third order, and the weighting is Intelligence Tests, three; School Examination, one; School Report, one. It is worth noting that in last year's examination, out of nearly 400 pupils who came highest in the Intelligence Tests, only nine boys and twelve girls failed to gain admission to the selective secondary schools through the higher scoring of others in their school records and examinations.²

This scheme is flexible and can be adapted when the technical high schools develop. The standard of general intelligence required for the grammar schools and technical high schools can first be determined; then the guidance of the approved pupils into one or other of the two types of schools can be determined (with due consideration to the wishes of the parents) by the reports of the primary schools, aided by specific performance tests and other tests of special abilities if and when it is agreed that they can profitably be applied at the age of eleven.

The advantages of such a scheme are, first, that the primary schools are not competing with one another in a public examination; second, that school records can have an influence in selection *within each school*, without the insuperable difficulty of evaluating the reports of one school as compared with those of another. But we must emphasise first the need for a preliminary

¹ In my pamphlet *Examinations and the Examinee* (The Birmingham Printers, 1938).

² A full account of the scheme in action at Walsall is given by Mr. V. J. Moore in this *Journal*, Vol. 18, Feb., 1948.

coaching in an intelligence test for all pupils ; and also the need for at least two final tests, for as Mr. Alan G. Rodger has shown, in a series of the same tests the average range of a child's I.Q.s may be as much at 10 points.¹

Another possibility in the immediate future is an increase in reliable evidence as to child development (including maladjustments) and a decrease of unreliable evidence, through the *application of statistical checks*.

Wrong ideas have been spread by generalisations on far too little evidence ; for example the early statements by Adler and others as to the supreme importance of a child's position in the family—the danger of being the eldest or youngest. We now find that when the various enquiries as to such matters have been added together, they pretty well cancel out. Yet many people are easily impressed by a confident assertion, say that the eldest boy becomes aggressive, or that the second is likely to suffer from an inferiority complex ; because, when they hear such a statement they are apt to consider the children they know, discover one case which fits, and promptly agree with the generalisation.

Unfortunately, dogmatic assertion without precise evidence is encouraged by the fact that an extreme statement attracts attention so much more readily. State, as A. S. Neill does, that *every* theft by a child is really an outcome of the craving for love, and your lectures, as he says of his own, are crowded out. But if you state precisely what percentage first the young thieves form of their own families, then the percentage of those delinquents whose homes show a lack of affection, and compare it with the percentage of children who are *not* little thieves but whose homes also show lack of affection, and finally present various correlations with other observed phenomena—then, most audiences would begin to get bewildered and bored.

Of course, careful statistics cannot make up for bias or weakness in original observations ; and I admit that some people seem carried away with the glory of statistics, as such ; they may revel in decimal points in I.Q., when a re-testing of the same child by another psychologist or even by the same psychologist a few weeks later, may give an I.Q. of several units either up or down.

But I am not here pleading for elaborate refinements ; only for at least elementary checks upon evidence. Too often we find the only evidence offered for a bold statement in child psychology consists of a few examples. I once heard an eminent medical psychologist in London refer to a girl who had an irresistible impulse to count the windows of any room she entered. He interpreted this as a serious symptom of a neurosis. Being sceptical about this, I made enquiries among 300 university graduates, nearly all of whom were doing satisfactorily the difficult work of teaching under supervision ; I found that about 95 per cent. had had some such compulsive obsessions during their own childhood.

Only recently the Director of a Child Guidance Clinic in the North of England sent me for publication a report on a small group of cases. He called attention to the special significance of the position of the child in the family and mentioned that a substantial percentage of the problem children were the *youngest* children in their families. But a simple calculation showed that, in families of the sizes concerned, youngest children would inevitably constitute about that same percentage of the children, so that the youngest children were actually no more frequent among these difficult children than we should expect them to be on the basis of mere chance.

Even so distinguished a psychologist as Arnold Gesell, in his most recent book, *The Child from Five to Ten*, greatly weakens his generalisations as to

¹See this *Journal*, Vol. VI, 1936.

the typical six or seven-year-old children, compared with the eight or nine-year-old, by giving no estimate of the degree or frequency of variations in the various qualities for each age.

Let our younger psychologists not be unduly alarmed. It is not suggested that we must all master the technique of factor analysis, or all be able to read our new statistical journal with ease; or that experiment and the direct study of the individual child or adult, or of one's inner self, will ever cease to be the true foundations of psychology. I am only pleading for a marriage of genetic psychology with elementary statistics. That eventually the genetic will become the more important partner in such a marriage is predicted even by such a master of statistics as Sir Cyril Burt. In his *Factors of the Mind* (p. 245) he writes: "The first provisional results of factorial psychology will have to be supplemented, and even very largely superseded, by the functional and genetic study of the mind."

With such weighty support for a belief in the importance of genetic psychology, I am encouraged to emphasise, in conclusion, some hopeful possibilities in child psychology. First, I think we may look to the study of the earliest years of childhood for more decisive evidence of what are, and are not, innate tendencies. More extensive observations on infants from birth, who have been born and bred in institutions, or in the same family, would give us a rich fund of evidence as to individual differences in inborn tendencies; but they must not be undertaken by psychologists starting with a conviction as to the supremacy of either innate or of environmental factors.

Second, the recent work of anthropologists who question the existence of many innate tendencies should be supplemented by the observations by trained child psychologists on infants from the earliest months among primitive peoples.

Third, as to development of character or personality, we need a much wider study of representative samples of *unselected* children during early childhood as a standard for comparison with problem children. There is a real danger as we have seen that some forms of undesirable behaviour may be taken as a sign of abnormality though they may be found not only in 'problem' children, but in the great majority of children who develop quite satisfactorily.

Fourth, we need careful *follow up studies* of the same children from infancy, not only to adolescence but into young manhood; for success in school is not the final criterion, as it is often assumed to be. Here we have a great example in Terman's research on 1,000 gifted children with I.Q.'s of 140 or more. He was able recently to contact 95 per cent. of them later at the average age of thirty. Many of their children were also tested, those of I.Q.'s of 150 or more being many times greater than the average, though, unfortunately, the children were not numerous enough to replace the stock. Terman gives many details of the later success of these 950 gifted children, and follow up studies are already arranged for up to the year 1970, when the average age of the high school group will be sixty-three.¹

The cost of this research already amounts to over £30,000, and in this country we can hardly emulate such vast scale investigations. But there are other types of study equally needed, for example, as I have suggested, the study of children much earlier than Terman's children were tested. Also we need detailed studies not only as to temperament and as to general intelligence, but as to *specific abilities*. Here we have almost a virgin field. Enquiry has been discouraged by a widely accepted view that we cannot find evidence for special abilities; except in music and drawing, before the age of about eleven, except in

¹ See the pamphlet on *Psychological approaches to the biography of genius* (Eugenics Society Papers, H. Hamilton, London, 1947.)

a few cases. But that may be because we have not yet discovered the appropriate tests or observations. The specific abilities may be there, lying dormant, even if we cannot detect them. If they do exist, their discovery would also help the estimate of general ability at a very early age; and if you want a practical value for this, one would be for advising as to the adoption of children. Furthermore, the early detection of innate special abilities, or the proof of their absence, would help to solve the problem as to how far later special aptitudes are really due to special training or interests rather than to innate special abilities.

Already according to Burt and Schonell, we have evidence of specific perceptual ability involved in reading, revealing itself at least by eight years. Margaret Malone has recently shown that a special space factor appears in tests with boys at seven years though not with girls.¹ Burt long ago found a substantial verbal factor revealed in certain Binet Tests as early as four and five years.²

In reference to language development, there is considerable evidence that little girls of two years are, on the average, ahead of boys, though general ability is estimated to be the same. If this sex difference occurs, can it be other than a specific ability?

On my own five children I made day-to-day observations from birth, noting not only the earliest date of speaking or understanding a word, but much earlier phenomena—imitating word sounds, practising new noises, and even responsive 'cooing' to the mother. I found great and consistent individual differences in these. The girl Y was the most precocious in *all* these phenomena. The boy B was behind Y in all, but ahead of the boy A in all, and so on. Also the orders could not be explained by general intelligence as tested then and in later childhood; indeed, as soon as the language tests involved more intelligence, as in complex sentences and the use of conjunctions, B went ahead of Y, and others moved up. But in fluency and even verbalism, the order remained precisely the same right into maturity.³

Of course, these series of orders may only be coincidences. A few cases like these, as I have emphasised, can only suggest the lines for much wider investigations.

As to *temperament and personality*, I also found highly specific traits even before the age of two, which remained characteristic of the individual when grown up. But follow up studies into adulthood of one's own children's personalities are a delicate matter, especially when one of the children is a budding psychologist and might retaliate with a psychological study of old age, or even of second childhood! I can only briefly state my own conclusions:

(1) That the main characteristics of the individual disposition were revealed in the first three or four years; (2) that great individual differences appeared which one could not possibly attribute to different training or environmental influences; and (3) that some marked individual differences could be traced to a re-shuffling of characteristic traits in the father and mother.

Arnold Gesell provides records in support of such views as to the importance of innate factors in personality; and of course we have much evidence in the diverse personalities of unlike twins brought up in the same home. But again for the full establishment of such views we need either many more observations on children born and bred in the same institutions, and what is most desirable, a much higher birthrate than we find at present in the families of our expert psychologists.

¹ *Brit. Journ. Psych.*, Vol. XXXV, Part I, 1944.

² See his *Mental and Scholastic Tests*, 2nd edit., 1947, p. 137.

³ See chapter on "Language" in *The Psychology of Early Childhood* by C. W. Valentine.

Having made some criticisms earlier of Gesell's recent book, *The Child from Five to Ten*, I am glad to conclude with a quotation from it which expresses better than I could do myself, a great faith in future possibilities of child psychology. I might have added that it expresses that faith also more confidently than I can ; yet I recall William James's notable definition of faith—" If the essence of courage is to stake one's life on a possibility, so the essence of faith is to believe that the *possibility* exists." If that definition be accepted, then I can also subscribe to Gesell's declaration of faith. He writes :

" We cannot conserve the mental health of children, we cannot make democracy a genuine folkway, unless we bring into the homes of the people a developmental philosophy of child care rooted in scientific research. A science of man, accordingly, becomes a creative force in the atomic age. It will diffuse among peoples, among common men, and among leaders of State that increase of intelligibility which is necessary for mutual understanding. In a more sincerely sustained effort to understand children, men and women of maturity will better comprehend themselves and their fellows."

INSECURITY AND SOCIAL MALADJUSTMENT IN CHILDREN.¹

By C. SANDERS

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I.—*Statement of Problems.* II.—*The Test.* III.—*Results of Experiment.*
IV.—*Conclusions.* V.—*References.* VI.—*Appendix.*

I.—STATEMENT OF PROBLEM.

THE expression of personality evidenced in social and emotional attitudes and behaviour presupposes an interplay of forces between the individual and his environment, and especially between him and that part of the human environment with which he comes into closest contact, including the members of his family, his elders, friends, enemies, compatriots and so on.

Clinic and similar workers concerned with the personality problems of children in the light of their behaviour disorders or social maladjustments have frequently put forward the view that the observed symptoms were in many cases due to *insecurity* or that the subjects of observation were in *need of security*.

The terms *security* and *insecurity* have, however, been loosely used, and there needs to be a differentiation in meaning according as the emphasis on the terms is social or psychological.

Security is of two kinds—that which is concerned with an external situation and that which is essentially a state of mind. The former may be called objective or social security and the latter subjective or psychic security. The two states though closely interrelated are not inter-dependent. Social security implies the provision of bodily needs, satisfactory social contacts when externally viewed, and indeed, all that is implied in a stable social order. Psychic or mental security on the other hand may be defined as mental at-easeness or stability and it may exist despite the substantial lack of almost everything that constitutes a secure environment. Conversely, the individual who is already mentally insecure may show no reasonable response to the provision of his bodily needs nor to the solicitations of those about him. Thus while a first person may adventure in the face of social insecurity, a second may be found retreating from social reality or fighting it as uselessly as Don Quixote fought windmills.

To test the concept of security as a factor in social adjustment as well as to determine the extent, if any, of the relatedness between mental insecurity and problem behaviour, several attitude tests were developed just before the war and were given to two separate groups of boys, one in London clinics and the other in London schools. For present purposes it is the clinic group which is the more important, and boys in the group, numbering fifty, were drawn from London and East London Child Guidance Clinics, Maudsley and Tavistock Children's Departments, and from the Institute of Child Psychology.

II.—THE TESTS.

The tests, two of which, together with tentative norms, are given in an appendix, were validated in several ways. Firstly, many of the items derived from the direct experiences of clinic boys, the factors having been noted during

¹Adapted from portion of a thesis, entitled "The Psychological Needs of Children and Their Relation to Behaviour," which was accepted in 1938 for the degree of Ph.D. in the University of London.

clinic staff conferences on individual problem cases. Secondly, the items were correlated for dichotomous and multiple-choice response with each test as criterion, and thirdly, certain items were correlated against clinic ratings for the same trait. Reliability was mostly based on the standard split-half method employing the Spearman-Brown Correction for length of test.

The tests were given to each clinic boy individually in the manner of the Binet, the earlier Stanford form (English revision) of which was used to rate intelligence.

The chief test denoted, INS, was designed to give a measure of mental insecurity deriving from factors in the social environment. It was composed of two sub-tests (1) PEI, referring to *physical and economic insecurity*, and partly employed as a buffer test, and (2) SUV, relating to *social undervaluation*. In practice, and in view of its relatively high validity (see Appendix), it was found that sub-test SUV could be used as a test on its own.

The second test, designated NST (see Appendix), was an attitude test expressing *non-social-tendency*.

A third test of lesser overall value was developed to bring out mental *impulse to adventure*. This test is referred to below by the symbols IA.

To the above battery was added the Pressey Interest—Attitude Test designed to give a measure of interest-attitude maturity expressed in terms of *emotional age*: Em A.

Remaining variables for correlation purposes consisted of (1) chronological age: CA, and (2) mental age: MA, as measured by the Binet.

The two main tests in the battery, together with their corrected split-half reliabilities, were as follow:

1.—Insecurity Test	INS .....	.89
Sub-Test	PEI .....	.80
Sub-Test	SUV ...	.86
2.—Non-Social-Tendency		
Test	NST.....	.80 ¹

III.—RESULTS OF THE EXPERIMENT.

The age range of the fifty clinic boys was from 9.67 years to 13.92 years with a mean of 11.83 S.D. 1.13 years. As clinic subjects they were relatively unselected and formed a representative group. Some had been referred by parents for a variety of behaviour disorders, others by judicial, health or educational authorities. All were in process of psychological treatment. They were day patients living in better or worse social surroundings. Most of them had a variety of symptoms well in excess of their referral problems, which in general fell into four classes, viz.:

- (1) Stealing with its concomitants of antagonism to authority, disobedience, unmanageableness, obstinacy, sullenness and lying.
- (2) School failure and lack of concentration.
- (3) Nervous and temperamental disabilities, including worry, excessive shyness, anxiety, fears, food fads, excitability, irritability, restlessness, temper outbursts and so on.
- (4) Physical symptoms including enuresis, faecal incontinence, tics, habit spasms, squint, fatigue, flushing, sweating, etc.

¹The biserial item validity values based on a dichotomous response are given in the Appendix. The average biserial validities for each test were: INS .59, PEI .54, SUV .63 and NST .56. However, as the final form of the tests involved a multiple-choice response, McCall-Long-Bliss validities for the items were calculated (2). These have a maximum value of .399. The average item values multiplied by 2.5 to render them reasonably comparable with the Bis r values were: INS .55, PEI .46, SUV .62, NST .59.

Generally speaking the INS test (insecurity test) and the NST test (non-social-tendency test) as well as the test of impulse to adventure, IA, tended to separate the anti-social group with actual or potential delinquency from the others, who, for the most part seemed to have more deep-rooted nervous or temperamental disabilities. This immediately raised the need for a thorough case analysis, especially with the latter subjects, which in turn disclosed that the type of insecurity being measured by the INS test was a conscious superficial insecurity that left unprobed the sources of deep-seated conflict. The results of the case analysis are largely irrelevant to the present problem although they are touched on again below.

The means and standard deviations for the clinic boys on the variables mentioned above were as follows :

Variable.	Mean.	Sigma.	Variable.	Mean.	Sigma.
1.—CA	11.83 years	1.13 years	4.—IA	9.16	3.73
2.—MA	12.26 years	2.57 years	5.—PEI	6.56	4.41
3.—EmA	12.54 years	2.58 years	6.—SUV	13.58	6.78
			7.—INS	20.14	9.49
			8.—NST	15.32	6.98

Among the fifty clinic boys, seventeen had specifically been referred for stealing and the responses of these on the INS test and on the NST test were in general distinctly more significant than at least 60 per cent. of remaining subjects. Among the remaining thirty-three, however, there were a number with delinquent tendencies, but to verify the strength of tests 4 to 8 above to select the seventeen delinquents from the rest, biserial correlation was employed with the following results :

	Bis r		Bis r
INS .....	.70	PES .....	.48
SUV .....	.66	IA .....	.40
NST .....	.60		

Thus all the tests as designed, including the test of impulse to adventure, were tending to separate out those with anti-social attitudes and behaviour tendencies ; and while the total insecurity test INS gave the highest biserial coefficient, sub-test SUV, giving a measure of mental insecurity arising from feelings of social undervaluation, proved a fairly strong selector in itself.

At this point perhaps it might be stated that the clinic boys, after an analysis of personality and environmental factors, were classified into three groups :

- (1) An aggressive group of delinquent type.
- (2) An anxiety or neurotic group.
- (3) An indeterminate group having characteristics common to groups (1) and (2).

The insecurity tests and the non-social-tendency test chose individuals in groups (1) and (3) rather than in group (2).

In considering the means and standard deviations of the INS and NST tests given above, it is important to remember the time at which the tests were presented to the clinic subjects. The tests proved diagnostic, and the most significant responses were obtained from those whose conscious mental conflicts with respect to their social environment were particularly acute at time of testing. Several clinic subjects, re-tested some time later at about their period of discharge, produced very much lower scores. On the other hand, during a first try-out with a group of school boys, the tests disclosed a delinquent, who, less than a week later, was convicted and sent to an institution. This raised a question as to the attitudes of those admitted to special schools for delinquents. However, a testing of some thirty such subjects about the same age as the clinic boys, but of lower intelligence, in one delinquent school resulted

in less significant responses.¹ In this case it would appear that the more stable institutional environment was reflected in the test scores. Unfortunately, it was not possible to test a group of delinquents at their time of entry to an institution.

An examination of the table of means given above, shows that the clinic subjects were slightly above average in intelligence (mean I.Q. 104 approx.), while their interest-attitude maturity, as estimated by the Pressey test and expressed as an emotional age, was very similar indeed to their intelligence when rated in terms of mental age. The Pressey Interest-Attitude test is slow to mark and it showed no pronounced tendency to discriminate among the clinic boys. But many of its items had a certain diagnostic value and it served a useful purpose when correlated with other variables as will be seen presently.

For comparative purposes the INS and NST tests, with some modification in manner of presentation, as well as the IA test (adventure), were given to 100 schoolboys of approximately the same age and intelligence, and with very similar scores on the Pressey Interest-Attitude test. The scores of these boys are recorded below :

Variable	Mean	Sigma
IA	11.42	3.46
PEI	6.18	4.61
SUV	6.48	4.45
INS	12.66	7.91
NST	10.18	4.67

With the above school group, the SUV, INS and NST scores are strongly skewed in the direction of a security and positive social response. On the PEI sub-test (physical and economic insecurity), the schoolboys on average show a similar result to the clinic boys but on the IA test a more positive impulse to adventure, although the delinquents among the clinic boys produced an average IA score almost identical with that of the schoolboys. If the critical ratio of the difference of the means is used to compare and contrast the mean scores of the two groups, then the clinic boys as a whole to a rather significant degree showed less impulse to adventure (IA test), a greater degree of mental insecurity in relation to the social environment (SUV sub-test), and more marked tendencies to non-social attitude (NST test).

The eight variables previously mentioned (including the INS test and its sub-tests) were intercorrelated for the clinic and school groups and a Thurstone factoranalysis (4) was applied to the results. The figures for the school group are not given, since, having regard to skewness and differences in the standard deviations of the scores, the coefficients in each case were rather similar, the most noteworthy difference being that the age variables with the school group, in place of zero or completely negligible coefficients (see table below), gave low, and in several cases, acceptable negative coefficients with the Insecurity Test and its sub-tests.

For the clinic subjects the correlations were :

	1	2	3	4	5	6	7	8
1 CA		.49	.45	.14	.01	.00	.01	.12
2 MA	.49		.51	.34	.01	-.09	-.02	.18
3 Ema	.45	.51		.26	-.24	-.25	-.25	-.14
4 IA	.14	.34	.26		.22	.17	.18	.39
5 PEI	.01	.01	-.24	.22		.48	.77	.37
6 SUV	.00	-.09	-.25	.17	.48		.90	.54
7 INS	.01	-.02	-.25	.18	.77	.90		.56
8 NST	.12	.18	-.14	.39	.37	.54	.56	

NOTE.—Correlations of .35 are significant at the 1 per cent. level and correlations of .28 at the 5 per cent. level.

¹ A similar type of result was obtained by Miss Margaret Robinson (3) who gave the tests to children in various types of institution (including orphanages, etc.) in and around Perth, Western Australia.

The fact just mentioned that the age variables with the school group of 100 boys tended to give negative correlations with the Insecurity tests, raises a point concerning emotional age (i.e., interest-attitude maturity) as measured by the Pressey test. If, with respect to this variable, the two groups are considered together, then, despite the comparative lowness of the correlations, there is evidence that maturity of interest and attitude is significantly, if not markedly, related *negatively* to insecurity. In other words, we seem to have bi-polar estimates of the same component of the total personality so that if the estimates are expressed in uniform terms, maturity of interest and attitude is related in some degree to mental security and immaturity of interest and attitude to mental insecurity.

Some further points of interest are to be found in the correlation table, however. There is, for example, no demonstrably strong relation between intelligence and Pressey interest-attitude maturity. When chronological age was held constant, in the case of the above clinic correlations, the partial co-efficient for emotional age and mental age was .24, and with the school correlations it was zero.

Further, as far as sub-tests PEI (physical and economic insecurity) and SUV (social undervaluation) of the complete insecurity test INS are concerned, analysis by multiple regression shows that with the clinic subjects, the SUV test carries about twice the weight of the other in assessing mental insecurity. In other words, among the clinic boys, the mental insecurity disclosed was an insecurity bound up with their consciousness of unsatisfactory social relationships rather than with their consciousness of physical or economic conditions. On the contrary, among the schoolboys tested, the PEI and SUV tests carried approximately equal weight because feelings of strained social relationships or of social undervaluation were very much less significant among them.

The material employed in the present investigation is not of the type that is usually subjected to statistical factor analysis, nor is it customary to include a test and its sub-tests in such an analysis. Nevertheless, in view of the above observations arising from the clinic correlations, some interest attaches to the kind of information supplied by an analysis of the correlation table. When limited to two factors, the loadings obtained from using the standard Thurstone centroid method (4) and Guildford axis rotation (5) through Test 7 (INS) were:

Factors as Resolved			Factors after Rotation		
		I II	I ¹ (i) II ¹ (m) h ²		
1	CA	-.407 - .484	-.015 .632 .400		
2	MA	-.466 - .601	-.048 .759 .578		
3	EmA	-.206 - .705	-.312 .665 .539		
4	IA	-.502 - .182	-.256 .469 .285		
5	PEI	-.572 .449	.726 -.042 .529		
6	SUV	-.640 .588	.869 .018 .755		
7	INS	-.739 .652	.985 .000 .971		
8	NST	-.620 .246	.628 -.226 .445		
Variance			.352 .211 .563		

The statistical factors when rotated for psychological significance indicate an *insecurity* factor (i) common to the insecurity tests and to the test of non-social-tendency. This factor shows a small positive adventure loading while the loadings with the age variables are insignificant or negative. Test 3, associated with interest-attitude maturity, shows a negative loading.

The second factor seems to be a *maturity* factor (m) associated with increasing age, mental development and maturing interests and attitudes. This factor shows negligible insecurity loadings, a slightly negative non-social loading and a possibly significant adventure loading.

The analysis throws into relief points already observable in the correlation table. The factor patterns indicate a relationship between mental insecurity

and non-social tendency as measured, a possible relation between maturity and impulse to adventure, and no relation, or if a relation, then a negative relation, between physical, intellectual and emotional maturity and mental insecurity. There is, moreover, no common psychological factor in the ordinary accepted sense since the two major components of personality measured, are, on the evidence, relatively incompatible (6).

Finally, according to the item validities (see Appendix), the clinic subjects in the INS test emphasized most strongly the following indicators of mental insecurity:

- (1) Distrust and suspicion of the opinion of other people.
- (2) Sensitiveness to ridicule.
- (3) Feelings of unfairness, blame and repression.
- (4) Anxiety about parents.

IV.—CONCLUSIONS.

1.—*Security* is of two types: That which is concerned with an external situation, and that which is a state of mind. The former may be called *social security* and the latter *mental or psychic security*.

2.—There is a relation between mental insecurity and social maladjustment with its accompanying behaviour difficulties and non-social attitudes. However, with the tests employed the mental insecurity measured was a conscious insecurity which tended to be accompanied by the type of aggressive attitudes and tendencies usually associated with delinquency. Moreover, the insecurity disclosed, was, to a considerable extent, bound up with feelings of social undervaluation.

3.—Mental insecurity, less obviously at the conscious level, or of which the subjects themselves were less consciously aware (including disturbance giving rise to neurotic disorders, emotional or temperamental instability, bodily movements, incontinence, anxieties, fears and so on) was less well measured by the tests. Insecurity items scored by neurotic subjects related rather to superficial mental symptoms, while subjects concerned scored relatively low on a test of non-social tendency, the items of which emphasized somewhat aggressive attitudes or behaviour impulses.

4.—A factorial analysis of the results of intercorrelation of the variables employed supported the *a priori* view that mental maturity in terms of physical, intellectual and emotional development is positively related to mental security and perhaps to impulse to adventure.

V.—REFERENCES.

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VI.—APPENDIX.

THE INSECURITY AND NON-SOCIAL TENDENCY TESTS.

(1) The items of the Insecurity Test, including its sub-tests, are phrased to give an insecurity response. Certain items, however, can be reversed for variety, providing the scoring is adjusted accordingly.

(2) The tests are presented as individual clinic tests in the manner of the Binet, the person giving the tests carefully explaining to the subject that he is going to read to him the actual sayings, feelings, and happenings of some boys he knows and that he wants to find out whether the subject is like the boys he mentions. The tests are diagnostic and are generally most useful with maladjusted boys between the ages of 9 and 15 years.

(3) The scores for significant responses on each test are 3 and 2 in every case. Differential scoring was tried but gave little added improvement and the simple 3—2 scoring represents considerable saving in time. No score is given for an insignificant response.

(4) In the Insecurity Test positive answers to either of the following questions asked after presenting each item are regarded as significant :

- "Are you exactly like (boy's name) ? " 3 points.
 "Do you feel like (boy's name) a little bit ? " 2 points.

When negative responses are obtained to each of the above questions, a further confirmation question is put :

"Are you quite sure you are not like (boy's name) at all ? "

The item is regarded as having no significance if the subject is quite sure and no points are scored. If the subject is doubtful, the earlier questions may be repeated, and if the subject answers "Sometimes," 2 points are scored.

(5) The scoring of the Non-Social Tendency test is similar, the questions asked after presenting each item being :

- "Do you think you're like (boy's name) very much ? " 3 points.
 "Do you think you're like him a little bit ? " 2 points.
 "Are you quite sure you aren't like him at all ? "

(6) The total points from all items in each test or sub-test (but excluding the trial items) represent the insecurity or non-social score on that test.

(7) Tentative norms for the tests are set out below, the symbols INS, PEI, SUV and NST referring respectively to the Insecurity Test as a whole, the Physical and Economic Insecurity Sub-Test, the Social Undervaluation Sub-Test, and to the test of Non-Social-Tendency.

	PEI	SUV	INS	NST
Insignificant	Under 4	Under 6	Under 9	Under 8
Hardly Sig. ...	4 - 6	6 - 10	9 - 16	8 - 12
Significant	7 - 9	11 - 15	17 - 24	13 - 17
Highly Sig.	10 - 12	16 - 20	25 - 32	18 - 22
Very Highly Sig.	13+	21+	33+	23+

(8) The test items are set out below, the values in brackets being biserial validity coefficients for a dichotomous form of the tests during an original trial giving. The higher values point to items of greater discrimination or significance.

INSECURITY TEST—INS.

Sub-Test PEI: Trial Items :

- (a) When Bob is in the street he often feels afraid of getting hurt.
- (b) John sleeps badly at night and the slightest noise seems to wake him up.
- 1.—(.33) Joe does not go to bed until nearly midnight every night.
- 2.—(.39) When Jack goes to sleep he always has dreams and nightmares.
- 3.—(.35) In winter Noel always feels cold when he's at home.
- 4.—(.57) Stan worries because his father can't get a job.
- 5.—(.60) Bob reckons there are far too many people living in his house.
- 6.—(.62) Ned worries because his father's often sick.
- 7.—(.31) Ben always feels tired.
- 8.—(.52) Quite often Colin can't go to sleep because a dance tune he's heard keeps running through his head.
- 9.—(.60) Len worries because he might be like his brothers or sisters who can't find jobs.
- 10.—(.63) Eric feels he's not dressed as well as other boys.

- 11.—(.92) Dan feels that someone in his family drinks too much beer.
- 12.—(.57) Jack worries because his mother, who goes out to work, is made to work too hard.
- 13.—(.75) Tom gets worried because his mother's always sick.
- 14.—(.56) Harry always seems to suffer from aches and pains.
- 15.—(.56) Jim never gets enough pocket money to spend.
- 16.—(.50) Fred worries because his mother and father are always quarrelling.

Sub-Test SUV : Trial Items :

- (a) Ned said : I'm not as lucky as other boys.
- (b) Eric said : I'm not much good at games.
- 1.—(.88) Roy said : My brothers or sisters or other members of my family aren't fair to me.
- 2.—(.50) Allan said : No-one ever praises me.
- 3.—(.47) Len said : People often think I'm queer.
- 4.—(.65) Eric said : The others are always trying to make fun of me.
- 5.—(.53) Jack said : Teachers try to make out I can't read as well as other boys.
- 6.—(.59) Ned said : I don't think the other boys like me.
- 7.—(.68) Bob said : Everyone tries to make out that I'm not clever.
- 8.—(.82) Joe said : No one ever gives me presents.
- 9.—(.47) Harry said : I'm often a failure.
- 10.—(.77) Don said : The others tell lies about me.
- 11.—(.52) Noel said : I've hardly any friends at all.
- 12.—(.57) Ben said : My teachers are always complaining about my arithmetic.
- 13.—(.81) Dan said : I'm always being scolded or punished by someone.
- 14.—(.56) Eric said : I'm never allowed to do anything I want to do when I'm at home.
- 15.—(.68) Colin said : I never seem to be allowed to keep anything of my own.
- 16.—(.51) John said : Teachers reckon I can't spell.
- 17.—(.58) Ned said : I'm always being blamed for other people's faults.
- 18.—(.69) Bill said : The others are always calling me names.
- 19.—(.67) Don said : I'm not allowed to play when I want to.
- 20.—(.54) Stan said : Teachers always hurry me too much with my schoolwork.

NON-SOCIAL TENDENCY TEST—NST.

Trial Item : Bill likes playing pranks or jokes on other people.

- 1.—(.46) Harry always gets his own way when he's at home.
- 2.—(.44) Bill makes his brothers or sisters or other people do what he tells them.
- 3.—(.45) Fred's got a temper.
- 4.—(.54) Ted's always having rows, quarrels or fights.
- 5.—(.57) Len would leave school or run away from it if he could.
- 6.—(.50) Dan thinks it's silly to give things away to other people.
- 7.—(.60) Roy doesn't like being beaten in a game. He gets angry or annoyed.
- 8.—(.49) Bob never tells anyone his secrets.
- 9.—(.79) Frank thinks it's quite right to tell a lie when you know you won't get caught.
- 10.—(.58) Jim's the leader of a gang.
- 11.—(.44) Len likes to daydream about the great things he's going to do.
- 12.—(.58) Jack thinks that being found out is worse than doing something wrong.
- 13.—(.60) After Bill has been punished he always refuses to do anything at all.
- 14.—(.56) John likes teasing other people.
- 15.—(.74) Harry always does the opposite of what people tell him to do.
- 16.—(.56) Bob pays back anyone who does him a bad turn.
- 17.—(.37) Henry hits anyone who calls him names.
- 18.—(.72) Joe says it's quite right to take something belonging to someone else when you haven't been treated fairly.
- 19.—(.58) Ted doesn't like teachers.
- 20.—(.67) If anyone bosses Eric about, he does what he's told but thinks a lot,

A NEW "GENERAL INFORMATION" TEST.

By E. ANSTEY, R. F. DOWSE, AND M. DUGUID
(Three members of a Psychological Research Unit working in London.)

I.—Description of test. II.—Experimental try-outs. III.—Results by professions.
IV.—Conclusions and future plans.

I.—DESCRIPTION OF TEST.

THE General Information Test is being developed, not as a selection test, but in order to compare the general cultural and educational level of different groups of people.

The test is of the "matching" type, which combines objectivity of scoring with a small element of chance. It consists of a list of 120 well-known people, together with a list of fourteen professions or occupations. The subject has to write against the name of each person the number of the occupation in which he (or she) became principally famous. One mark is given for each person correctly placed.

Of the 120 names, 36 were British. The other large national groups were as follows:

French	18	Italian	6
German	14	Russian	5
American	6	Greek and Roman (Classical)	15

The rest were mostly from the smaller European countries.

An attempt was made to spread the names in each professional group over the centuries, and the draft test consisted of the following:

Profession.	B.C.	1-16th Century	17th Century	18th Century	19th Century	20th Century	Total
Actors (or Actresses)	—	—	—	1	4	1	6
Architects	1	—	2	—	—	2	5
Composers	—	—	1	1	2	6	10
Generals	3	—	—	—	4	—	7
Historians	3	—	—	1	1	1	6
Novelists	—	—	1	2	3	2	8
Painters	—	2	—	1	2	3	8
Philosophers	2	1	1	1	—	1	6
Playwrights	2	—	1	1	2	1	7
Poets	2	1	—	—	4	1	8
Scientists (and Mathematicians)	1	3	4	4	6	4	22
Sculptors	3	—	—	—	1	3	7
Singers	—	—	—	—	1	3	4
Statesmen (and Politicians)	1	—	1	—	3	11	16
Total	18	7	11	12	33	39	120

The list of professions was intended to be as comprehensive as possible, but numerous difficulties were encountered. Many important professions were considered but could not be included for one reason or another. Religious leaders, for example, would have overlapped too much with philosophers. Again it was found impossible to distinguish between different branches of science, since so many scientists have been active in more than one science, or between scientists and mathematicians. It was also practically impossible to get an even spread of dates for generals or for statesmen, since in the past so many generals have also been statesmen. The names were intended to cover the complete range of difficulty from the best known to equally important but less well known people. In some professions, however, such as Historian and Sculptor, it was found that there was no-one who was known by most people in our main experimental group. As regards composers, on the other hand, it was feared that many of the classical composers would be too well-known, and a high proportion of modern composers was included in the hope of providing more effective discrimination. Names such as Tintoretto which might suggest the correct profession, or Giotto which might suggest some other profession, were deliberately avoided. For the same reason it was decided that if either Einstein or Epstein were to be used, both would have to be included close together, to reduce the risk of a careless confusion of identity.

II.—EXPERIMENTAL TRY-OUTS.

The first draft of the test had been tried out on a representative group of 100 civilians, the majority of whom had school certificate and some of whom had university education. They obtained a mean score of 66.8 out of 120. A detailed item analysis was carried out, dividing the sample according to total test score in a higher group of 50 (H) and a lower group of 50 (L), and calculating for each item the correlation between the item and total test score. The results of item analysis were extremely satisfactory, twenty-four items achieving perfect discrimination. Taking Laura Knight, for instance, not one H placed her wrongly, but thirty-seven L did. Or taking Proust, forty-five H identified him correctly, but not one L did. Making a few minor revisions on the basis of the item analysis, the draft test under consideration in this article was prepared, all the items in which are known to have high internal consistency.

The second try-out, from which the information given in this article was obtained, was on a group of 581 soldiers, nearly all 18 or 19, in July, 1946. Their mean score was only 19 out of 120. The test has, therefore, been made slightly easier by replacing some of the less well-known people by extremely famous names, and in its final form will be given experimentally during the summer of 1948 to 500 soldiers and 3,000 civilians, for whom a great deal of other information will be available.

Our thanks are due to the Directorate for the Selection of Personnel, War Office, for their co-operation in providing facilities for these experiments.

III.—RESULTS BY PROFESSIONS.

After the try-out the items were classified for analysis into the fourteen professions. The number against each name is the number of subjects who gave the correct answer. The names within each group have been arranged in order of "popularity." The sample totalled 581.

(1) Actors (or Actresses).

Ralph Richardson ..	358	David Garrick	148	Henry Irving	110
Ellen Terry	164	Sarah Bernhardt ..	128	Mrs. Siddons	92

The results were as expected. Memory of the famous actors and actresses of the nineteenth century has not altogether faded, but they are markedly less well-known than Ralph Richardson.

(2) Architects.

Christopher Wren ..	304	Giles Scott	39	Norman Shaw	6
Inigo Jones	47	Ictinus	6		

The interesting fact in this group was the large difference between the number of people who knew Wren and those who knew Inigo Jones.

(3) Composers.

Mozart	508	Holst	113	Poulenc	40
Sibelius	238	Bartok	100	John Field	21
Purcell	174	Peter Warlock	52	Aaron Copland ...	17
César Franck.....	117				

Mozart was the second best known of all the names in the test.

(4) Generals.

Hannibal	188	Ney.....	88	Leonidas	36
Robert E. Lee.....	181	Suvorov	71	Quintilius Varus ...	22
Blücher	173				

It was interesting that Lee should be relatively so well-known—about as “popular” as Blücher. It is possible that he is remembered partly because his name occurs in an American song. Suvorov was also better known than had been expected. A film about his life was shown in London during the war, but it seems unlikely that it was seen by many of the subjects. It might conceivably have been a lucky guess by some subjects, but the high consistency of the item with the whole test would argue against this.

(5) Historians.

G. M. Trevelyan ...	87	Herodotus	50	Thucydides	38
Gibbon	86	Plutarch.....	48	Mommsen	14

Trevelyan and Gibbon proved to be less well known than had been expected. Trevelyan's *English Social History* had only just begun to circulate in 1946.

(6) Novelists.

Jane Austen	203	Cervantes.....	60	Flaubert.....	29
Trollope	109	Laurence Sterne ...	53	Proust	19
E. M. Forster	101	Dostoevsky	47		

This group did not include any authors of great popular appeal. The difficulty here is so many famous novelists have also written plays and poems.

(7) Painters.

J. A. M. Whistler ..	108	El Greco	61	Paul Klee	20
Joshua Reynolds ...	101	Manet	34	Dali	14
Laura Knight	99	Breughel	21		

The fact that the three British painters come above El Greco and Manet would suggest some “insularity” of knowledge. (The better known Italian painters had to be excluded either because they were also sculptors or because their names gave an obvious clue to their profession).

(8) Philosophers.

Socrates	205	Kant.....	48	Spinoza	20
Epicurus	120	Thomas Aquinas ..	47	Bergson	12

This is the only group in which the classical names were the best known. They were usually the least well known.

(9) Playwrights.

Ibsen	84	Tchegov	32	Congreve	30
Molière	78	Aristophanes	31	Aeschylus	22
Eugene O'Neill	43				

It is interesting that first-class dramatists, such as Ibsen and Molière, are less well known than composers such as Holst and Bartok. The lowness of the figure for Tchegov may be due partly to the fact that this (though correct) is not the popular spelling of the name. It will be spelt "Chekhov" in the final version of the test.

(10) Poets.

Keats	280	G. M. Hopkins	31	Catullus	23
Chaucer	147	Verlaine	28	Rilke	13
Sappho	37	Heine	23		

The relatively low figure for Chaucer may be due to the publication of *The Canterbury Tales* in prose form. Fifty-two people said he was a novelist.

(11) Scientists (and Mathematicians).

Edison	353	Röntgen	70	Galen	28
Faraday	211	Rutherford	64	Euler	17
Einstein	168	Copernicus	64	de Moivre	15
Darwin	146	William Harvey ..	62	Linnaeus	12
Boyle	124	Gauss	48	Ivan Pavlov	11
Galileo	109	Mendel	48	Pappus	10
Lister	103	Hippocrates	29	Fermat	8
Lavoisier	92				

The relative "popularity" of Edison may be due partly to the fact that people come into closer contact with the results of his labours than those (say) of Faraday, partly to the film recently made about Edison. Even the most important pure mathematicians are comparatively unknown.

(12) Sculptors.

Epstein	165	Pheidias	16	Mestrovic	4
Rodin	23	Eric Gill	13	Myron	4
Praxiteles	17				

Apart from Epstein, who is probably famous because of controversy about his work, sculptors are almost unknown to the general public. Myron has been omitted from the final version of the text.

(13) Singers.

Gigli	335	Melba	89
Caruso	317	Chaliapin	61

This group illustrated the speed with which people in certain professions may be forgotten.

(14) Statesmen (and Politicians).

Lloyd George	546	George Canning ...	109	Thorez	33
Abraham Lincoln ..	478	Metternich	81	Gaius Gracchus....	26
Nehru	255	Arthur Henderson ..	81	Matteotti	20
Bidault	208	Kurt Schumacher ..	58	Jaurès	12
Benes	131	Chiffley	33	Ebert	8
Richelieu	128				

Lloyd George was the best known person in the whole test. The figures for contemporary politicians would naturally vary with time—Nehru and Benes, for instance, would probably be better known in 1948 than they were in 1946.

The results for Matteotti, Jaurès and Ebert, who were famous twenty or thirty years ago, suggest that there is a "blind spot" for politicians of the previous generation which persists until their names have entered the current history text books.

IV.—CONCLUSIONS AND FUTURE PLANS.

The analysis carried out to date gives an indication of how well known the people are, but the conclusions that can be drawn from this sample are very limited. The main feeling is one of surprise that some of the names in the test, e.g., Abraham Lincoln, were not better known.

One interesting result was the extent to which in some groups one man seemed to stand out above all others. This was particularly noticeable for :

Architects	..	..	Christopher Wren
Philosophers	..	..	Socrates
Sculptors	..	..	Epstein

Work that it is hoped to carry out after the 1948 experiments on 500 soldiers and 3,000 civilians includes :

- (i) A comparison of results for groups of different ages and education.
- (ii) Research into the time which elapses before a person is either forgotten, or occupies a permanent place in history. A man like Trollope, for example, may be well-known for a short time and then lapse into obscurity for a period before gaining his proper place in history. These periods may vary with different professions.
- (iii) An examination of the extent to which knowledge tends to be limited to certain fields or is spread over all.
- (iv) Analysis of the relations between the groups, e.g., Novelists, Playwrights and Poets *versus* Scientists and Mathematicians.

It is not claimed that these plans constitute an exhaustive survey of the material, and any suggestions for other possible lines of research would be welcome.

THE CHILD FROM FIVE TO TEN.

By ARNOLD GESELL and FRANCES L. ILG. (Hamish Hamilton, pp. 475, xii, 18s. 0d.)

AN honoured place in the history of Child Psychology is assured to the name of Arnold Gesell in view of his pioneer work at Yale University. His most original work on the first three or four years of life is embodied in more than a dozen books and numerous papers. In the present volume he extends his studies up to ten years and gives the records of observations on fifty children for each of the age groups—5, 6, 7, 8, and 9 years, and of a smaller number at 10. Unfortunately, there is considerable ambiguity in the description of the procedure, so that in an earlier review it was interpreted as probably referring to the *same* fifty children throughout these years. That would have made the book more valuable, and I gave the authors the benefit of the doubt. In a private letter to myself, however, Dr. Gesell explains that there were fifty *different* children at each of these ages.

Most of these children, it should be noted, came from "homes of good or high socio-economic" status, and were of "high average, or superior intelligence." In each age group there were twenty-five boys and twenty-five girls. Three-quarters of the children had also had repeated psychological examinations while they attended the Yale Guidance Nursery at ages ranging from 1½ to 4½ years.

In Gesell's earlier work on the first three or four years of life, he frequently stressed the supreme importance of internal factors in the development of the child. For these later ages of five to ten the authors emphasize again the dominance of the maturing of innate tendencies and of internal principles of growth. Valuable testimony is once more given against the extreme behaviourist view that environmental influences are almost omnipotent.

The authors give detailed studies of each of the years from 5 to 9 inclusive. For each year ten aspects of behaviour are described, namely, motor characteristics, personal hygiene, emotional expression, fears and dreams, self and sex, inter-personal relations, play and pastimes, school life, ethical sense and philosophic outlook. In the second half of the book each of these aspects of development is traced through its various stages from the first year to the ninth. Thus we get both cross-section and continuous pictures of development.

The bases of the reports were as follows. The children were given a psychological examination with the Yale development schedules, the Stanford-Binet Tests, some Performance tests and Attainment tests in reading. In addition there were observations of the children's play and other behaviour, an interview with the mother as to behaviour at home and at school, observation on the children in the school groups, and discussions with the teachers as to individual and group behaviour.

In an introductory chapter the authors point out that this period of middle childhood lacks the vividness of infancy on the one hand and of adolescence on the other. The tendency, they say, has been to generalise about the period as a whole, giving too little attention to essential and fundamental stages and fluctuations within these years. Owing to the ignorance of these subtle changes parents have been apt to blame schools for various maladjustments and the teachers to blame the child and the parents; whereas, it is maintained, often no one is to blame; for variations and even apparent regressions may be essential parts of advance forwards, just as crawling backwards is in most cases an essential part of acquiring the forward crawl.

As a marked example of such apparent regression the authors point out that whereas the five-year-old is on the whole a balanced individual, at six the child usually seems less integrated than he was even at three years old. Of course, in this country at least, the normal beginning of school at this period might be expected to bring about some disequilibrium, more particularly in those many children who have never attended a nursery school. Nevertheless, our authors believe this disequilibrium to be a fundamental and normal change.

The unique individuality of each child is emphasized throughout the book, though the usual characteristics of the different stages are at the same time emphasized; but the essential question, it is maintained, is not so much what the particular behaviour of the moment is, but what growth preceded and what growth is likely to follow.

Undoubtedly this volume includes many detailed records of child behaviour (especially at home) that will be illuminating to many thoughtful parents and teachers; and this quite apart from the question of the truth of the views expressed as to the essential characteristics of the different ages and the necessity for passing through the various stages. It is, however, regrettable that more precise estimates are not given of the various traits and types of behaviour and the frequency of their occurrence at the different ages, and of the range of individual differences within each age group. "Percentage frequencies were noted" we are told, "but were not made the sole basis for the final conclusions and are not reported in this volume. Sometimes a single but revealing behaviour led to the identification of a significant development trend."

The result is, we fear, statements as to development changes which cannot possibly be accepted as general without much more precise and extensive evidence. Consider for example the following, taken from the summary of changes in affective attitudes (p. 289):

- 4 years.—Quarrelsome and argumentative.
- 5 years.—Serious and business-like. Well equilibrated, but may be resistant.
- 6 years.—Highly emotional; marked disequilibrium between child and others.
- 7 years.—Gets on better with others, though disequilibrium within own feelings.
- 8 years.—Tendency to disequilibrium between self and others.
- 9 years.—Better equilibrium.

Such generalizations are, the authors say, not to be regarded as norms; only as stating what tends to occur at such years. But the distinction is surely hard to make; and the authors do say that the behaviour traits here outlined may be used to interpret the child's individuality and "to consider the maturity level at which he is functioning." One fears that parents and teachers will be puzzled to know whether John is developing unsatisfactorily, because, though seven years of age, he still resembles the disequilibrated six, or whether he is ahead of his time and like the characteristic eight-year-old.

My own day-to-day observations and records of five children from birth to adolescence leaves me still with the conviction that individual differences between children, even of the same family, at the same age of say six or seven, may be much greater than the difference between the same child at six as compared with seven, or even between six and ten.

The authors sum up the main characteristics of the various ages in "behaviour profiles" in which the following are the main features of personality.

Five years.—A period of smooth development 'organising' the experiences of the fourth year. Impression of 'competence and stability,' 'not over-demanding,' though seeking adult guidance. 'Self limitation almost stronger than self-assertion,' Obeys the mother readily. Good 'emotional equilibrium.'

Six years.—Lack of integration. Tends to go to extremes ; oscillates. He may say 'I love you' at one minute and shout 'I hate you' the next. "He reacts with his whole action-system. He does not only smile—he fairly dances with joy. He cries copiously when unhappy, kicks and shakes with his grief." "The ordinary six-year-old mind is not ready for purely formal instruction in reading, writing and arithmetic."

The young discoverer has to adjust now to two worlds, home and school, and here individual differences come ; the sensitive and immature children suffer most. Our authors, however, will not agree that the tensions and difficulties are simply due to the new environment of the school and its conflict with the home. Many tensions, they say, are *innate* in the very process of child development.

Seven years.—"There is a kind of quieting down at seven." He "goes into lengthening periods of calmness and self-absorption, during which he works his impressions over and over, oblivious to the outer world. It is an assimilative age, a time for salting down accumulated experience and for relating new experiences to the old." "There are mood changes from sweet-and-good to cross-and-tearful." Tantrums are now replaced by fits of sullenness. The seven-year-old is sensitive to the point of tears to disapproval. He is conscientious. He "rarely needs punishment because he is a reasoning and by nature a responsible being." (p. 155.)

Eight years.—"Boys and girls participate as equals in school and recreational activities." They share many interests ; but they are also becoming vividly aware of distinctions which separate them. The eight-year-old has "a certain inquisitiveness about all human relationships," but "far from being erotic, it is only one manifestation of his many-sided expansiveness." He is less sensitive, less within himself, less apt to withdraw. He will tackle anything, in fact, he likes hard things (p. 173). Not the helper he was at seven, what he does now is dependent upon his mood (p. 178). He "abhors playing alone." Individual differences are great.

As to intellectual interests it is well to recall that these children were as a group considerably above average intelligence and that they came from homes of the higher economic levels. Indeed, these facts have an important bearing on the question as to how far these profiles of personality are typical for unselected children of these ages. As to observations on sex-differences—which are not I think by any means over-stressed—we must also bear in mind that there were only twenty-five boys and twenty-five girls in each age group.

Nine years.—"Self motivation is the cardinal characteristic of the nine-year-old." He has a growing capacity to put his mind to things on his own initiative (p. 189). He resumes his attack in repeated trials. The sexes tend to draw apart ; indeed, "each sex cordially disdains the other" (p. 193), yet each may be affectionate and protective to younger brothers and sisters. There is a certain reasonableness in the psychology of the nine-year-old, and he has a better critical evaluation of his own ability.

Ten years.—There is greater self-possession. Individual differences become still more manifest. Sex differences are pronounced. The psychology of a ten-year-old girl is significantly distinguishable from that of a ten-year-old boy of equivalent breeding and experience. The girl has more poise, more folk wisdom, and more interest in matters pertaining to marriage and family.

These are only brief outlines of the fuller profiles given ; and the latter are supplemented by voluminous details culled from reports of the individual children. But again one is often left in doubt as to whether a particular form of behaviour is common at the age, or reported because of its inherent interest. To sum up, I feel that this book, though the product of a great amount of observation of many children, will be chiefly of value as a challenge and a starting point to other investigators, who, it is hoped, will report more precise estimates of behaviour traits and their relative frequency at different stages.

C. W. VALENTINE.

SUMMARIES OF RESEARCHES REPORTED IN DEGREE THESES¹.

A Comparison of Methods of Assessing Personality in Children.

By M. A. CUNNINGHAM

(*University College, London. Thesis approved for the M.A. degree.*)

In a recent symposium on "Personality" in this *Journal* (Vol. XV, 1945, pp. 107-121), Burt reviewed the various methods available for assessing personality, and concluded that the more formal "tests of personality" had a far lower reliability and validity than either the method of interviewing when scientifically carried out, or the more realistic devices which he has developed for observing the child in typical "standard situations." The object of the research here summarized was to make a more intensive comparison of the most promising of these latter procedures.

Twenty boys, aged 10 last birthday, from an elementary school in London, were assessed for 22 carefully defined traits of personality by means of a 5-point rating scale. After preliminary trials with various devices, four experimental procedures were adopted: (1) An interview based on a prearranged scheme; (2) An individual play-situation, in which each boy was given a sand tray, a set of small dolls appropriately dressed, and a set of dolls' furniture, and was asked to act out in play a demonstration showing how a family might spend their day; (3) A group play-situation, in which the boys were taken to a playroom in groups of four, and encouraged to play freely with various constructional materials, including wood, tools, sand, and water; (4) A group play-situation, in which the boys were invited to a tea-party in groups of four, and encouraged to play with each other in accordance with a prearranged programme. Certain standard situations were produced in the guise of simple indoor games, etc.

For comparison two teachers at the school who knew the children, namely, the class teacher (a man) and the head teacher (a woman), were asked independently to grade the boys for the same traits. The average correlation between the two teachers estimates for all traits was .39.

The combination of the ratings obtained from the two teachers was taken as the criterion; and the assessments for each trait, based first on each experimental procedure taken separately and then on all four combined, were correlated with the combined gradings for the same qualities.

Of the four experimental techniques employed, the highest average correlation was obtained with free play in the playroom. The correlations obtained from standard situations at the tea-party were nearly as high. The interview and the sand tray gave on the whole rather poorer results. However, a point hitherto not sufficiently realized is that different methods may be effective in bringing to light somewhat different traits. Thus the tea-party enabled comparatively good assessments to be made of such traits as good behaviour, self-display, impulsiveness and dependence. The playroom technique proved more effective in revealing such traits as talkativeness, dominance, self-assertion, and unselfishness. The sand tray revealed activity and aggressiveness better than any of the other methods, but was naturally of little value in revealing sociability or co-operativeness. The only trait for which the interview gave the best results was that of self-display.

The average correlation between the investigator's amalgamated assessments and the amalgamated assessments from the teachers for all traits was .40. It will thus be observed that these brief procedures yield assessments which correlate, if anything, slightly better with the average judgment of the teachers than the judgment of either teacher correlates with that of his colleague, although their judgments were presumably based on a prolonged acquaintance with the pupils in question. Moreover, for certain traits (notably inhibition, sociability, self-confidence

¹ These Outlines must be submitted through the Head of the Department in which the research was carried out.

and co-operativeness) the investigator's procedures appeared to give assessments that were actually more valid than those of either teacher taken singly.

Although the investigation showed that the techniques could be appreciably improved, the figures for the validity of the results appeared decidedly higher than those reported by investigators who have used more formal tests, such as the Rorschach, Thematic Apperception, or other so-called Projection tests, for similar purposes.

An Enquiry into the Attitudes of Secondary School Boys and Girls towards Arithmetic.

By W. A. FREEMAN.

Abstract of Thesis approved as part qualification for the M.A. Degree, University of Birmingham, 1948.

The data for the enquiry consisted of the replies to a questionnaire of 24 items, issued to some 2,000 adolescent boys and girls attending secondary schools in the Birmingham and N. Worcestershire areas. Strict anonymity was guaranteed to each pupil, and in numerous instances alternative answers to the questions were supplied.

The questions were divided for convenience into groups dealing with specific topics. These topics comprised emotional attitude towards arithmetic, arithmetic in school, hard and easy arithmetical topics, attitudes to some teaching methods, arithmetic and vocation, mental arithmetic, arithmetic and leisure, and arithmetic and psychological theories.

Comparisons were made between attitudes to different topics in order to find statistically significant differences due to age, sex or educational environment. The secondary tables compiled from the primary data were derived from frequencies only.

The enquiry as a whole did not show many striking differences in attitudes towards arithmetic between boys and girls. The latter appeared to have a stronger emotional reaction to it, and seemed to be less willing to undertake it as part of their employment unless they had a definite liking for it.

A change in attitude towards arithmetic on the part of the 14+ modern school girls was frequently apparent when they were compared with the younger age groups in the same type of school. The change pointed to a lessening in interest in arithmetic, and although the actual number of these girls was small, there is supporting evidence to show that such a lessening in interest may be general among older girls in these schools. (See this *Journal*, Vol. XV, 1945, p. 127.)

School Certificate work in grammar schools appeared to stimulate liking for arithmetic and interest in examinations in it among the older boys and girls. As the questionnaire was not issued to the lower streams of the grammar school group, it cannot be assumed that the tendency is general throughout these schools.

Belief in the value of arithmetic as a means of general memory training received support in all schools, especially modern schools. The pupils of the latter schools appeared to accept the suggestion of such training far more readily than the others. On the other hand, the modern schools had by far the smallest proportion of those who freely brought forward the idea of "formal training" in connection with the answers to it.

Consciousness of error was considerable in all the schools, and there was a general preference for written work rather than purely mental arithmetic. The girls in general showed a stronger preference for written work when compared with the boys, and everywhere several short sums were more favoured than one long one. There were some indications of a possible tendency to lean too heavily on written work.

There was much general agreement concerning the easiest topics in arithmetic, vulgar and decimal fractions leading, with logarithms enjoying popularity where

taught. The topics most frequently cited as difficult were stocks and shares and speed problems, while square root was considered as difficult by all except the grammar school pupils. Girls in general appeared to have more difficulty than boys with mensuration, possibly because of less time being spent on practical geometry.

Mechanical types of sum were more favoured than problems, while practical work with arithmetic appeared to be somewhat unpopular in the modern schools, where it is essential. On the other hand, the older grammar school boys showed signs that they would welcome more practical work in the curriculum.

Misconceptions concerning the place of arithmetic in certain vocations were common, emphasising the need for adequate vocational guidance. There was very marked general appreciation of the utility of arithmetic among these boys and girls. Much of this was somewhat exaggerated, many of them not realising that long arithmetical problems seldom arise in everyday life, and that arithmetic is almost entirely absent from the requirements of many occupations. The idea that the study of arithmetic makes children clever and leads to the securing of good situations was frequently put forward in the modern school group.

Considerable numbers expressed pleasure in the working of arithmetic in school, and gave evidence of a "play" attitude towards it. This was particularly so in the grammar and technical schools.

The Relations between Abilities in Grammar School Subjects and their bearing upon School Organisation.

By ALBERT G. ELLIS.

Abstract of a Thesis for M.Ed., Durham University, 1948.

The hypothesis that the secondary school child's abilities may be conceived in terms of mental factors linking particular groups of activities is suggestive of a method of school organisation giving both flexibility and coherence. The curriculum might be constructed from a number of unities formed of subjects associated with the different factors. Separate classifications within the same school by reference to the corresponding abilities might relate pupils to a greater variety of courses.

Previous research on the relations between abilities suggests that performance in early years is dominated by the general factor, supplemented by verbal, numerical, manual and other factors which increase in relative strength and mutual independence during adolescence.

In a new investigation, the School Certificate marks of 208 boys in English Language, English Literature, History, Geography, French, Mathematics, Physics, Chemistry and Art and of a further 198 boys in English Language, English Literature, History, French, Latin, Mathematics and General Science have been analysed. Correlations have been factorised by Thurstone's Centroid Method, with Rotation of Axes. Three independent factors, suggesting a development of those proposed by Burt as supplementary to "general educational ability" in his L.C.C. Report of 1917, are postulated to account for the results. The factors and associated subjects are:

- (1) an Informational Factor Geography, History, English Literature and (to a smaller degree) General Science ;
- (2) a Scientific Factor Physics, Chemistry, Mathematics and (to a smaller degree) Geography ;
- (3) a Linguistic Factor French, Latin, English Language, and Mathematics.

A system of school organisation is described offering alternative courses in the subjects shown to be linked by common factors. While immediate application is to the Grammar School, the method of organisation might be used in other types of secondary school, for which the psychological linkage of subjects requires further investigation.

BOOK REVIEWS.

School Broadcasting in Britain: RICHARD PALMER. (Published by The British Broadcasting Corporation, 1947, 3s. 6d.)

There has been for some time a need for a comprehensive statement of the general aims and methods of the Central Council for School Broadcasting, which, since 1929, has controlled school broadcasting in this country. This volume supplies this need. It is "not an official expression of either the Council or the B.B.C.," but, written by one of the members of the School Broadcasting Department of the B.B.C., with special chapters by his colleagues, and a foreword by the Chairman of the Council, it is clearly authoritative.

The book begins with a brief historical survey of the growth of the service in this country contributed by Mary Somerville, Director of School Broadcasting for nearly twenty years. There are then some general remarks on the aims, methods and resources of the schools broadcasting service, followed by chapters illustrating some of the problems peculiar to broadcast teaching, from the point of view of both studio and classroom. An indication is given of the way in which methods of production are influenced by the criticism and suggestions of listening teachers. Eight chapters are devoted to the particular aims and techniques of special subjects, while the last chapter indicates a number of questions on such matters as interest, attention, listening fatigue, and the effect of radio teaching on children of low verbal ability, upon which the B.B.C. would welcome the results of researches by teachers and educational psychologists.

Throughout broadcasting is put in its right perspective in relation to other teaching aids such as the film and gramophone. It insists that the broadcast is not a prefabricated, mass-produced lesson, and a substitute for a teacher, but "an experience for the children upon which the teacher can build." Few teachers who use the school broadcasting service will fail to be stimulated by this long overdue contribution to educational method.

L.B.B.

Lawless Youth: MARGERY FRY, M. GRÜNHUT, H. MANNHEIM, W. GRABINSKA, C. D. RACKHAM, and others. (Allen and Unwin, 10s. 6d.)

The student of delinquency is soon aware of the vagueness of the division between the normal and the abnormal. *Lawless Youth* reminds the reader of the same truth. It will, therefore, interest not only the probation officer, or the children's officer, but the youth leader, the social worker, the educational psychologist, the teacher; in fact, all supervisors of youth. I prefer to regard it as a study of one of the wider aspects of education.

The book is the work of a number of separate authors who sat on the International Committee of the Howard League for Penal Reform, in recent years. The background of experience of the members of this Committee is in itself a guarantee to the student of the authoritarian nature of its factual statements and the seriousness of the proposals it reviews.

Lawless Youth is really about the treatment of the young offender—those described by Margery Fry as the "under-privileged"—and in these six chapters by separate authors, four of whom deal with the Juvenile Court itself, the youth leader will find justification for his work in the service of youth, and the probation officer will find an expression of his ideals and ventilation of the vexed questions of status, magistrates and voluntary services. The last 100 pages of the book are devoted to two appendices on the legal aspects of the treatment of the young offender and the problem children in a number of countries. These two appendices constitute a valuable reference book in their own right.

Lawless Youth, then, is a book for all students; the expert and the novice. It is a reference book for some, a source of inspiration for others and food for thought for all. It is well to remember that it reflects the view of an international body of opinion.

E.W.H.

The Psychology of Personnel (306 pp., 10s. 6d.) and *Psychology Applied to Personnel* (pp. 167, 10s. 6d.): HENRY BEAUMONT. (Longman's, Green and Co., New York.)

Dr. Beaumont, who is in charge of the Bureau of Industrial Psychology at the University of Kentucky and who has had considerable experience in the training of industrial psychologists and personnel consultants, has produced two volumes which should claim the attention of all who are concerned with industrial production and working conditions.

The Psychology of Personnel is not in the ordinary sense a text book, and the author frankly states that its sole aim is to serve as a general introduction to the contributions which psychology has made, and should continue to make with ever increasing success, to the solution of the problems of personnel management. The first chapter deals in a most thorough manner with human relationships existing in employment situations, and this is followed by ten comprehensive chapters on such questions as job analysis, vocational selection and training, health and safety, and merit rating. All these problems are discussed in a practical and understanding way with a minimum of words, and while students of personnel management should not expect the book to train them how to do their work, it will undoubtedly help them to understand what personnel management means. The English reader may find some amusement in the mention of the business man with an inferiority complex who finds it necessary to smoke oversized black cigars and to put his feet on the desk when receiving callers, but references to such American traits are rare and the book is of real value to the English student.

Psychology Applied to Personnel is a companion volume and is definitely a text book. The first part gives the complete personnel records, test scores and merit ratings for ninety-four individuals working in a small factory engaged in cutting tools for the auto-motive industry. From these particulars the student is shown how to prepare frequency distributions, measures of central tendency, measures of variability, and other general statistics of use in personnel management. By an ingenious arrangement pages may be removed for practical work and this section is of considerable practical value to the student who is anxious to obtain definite practice in elementary statistical work.

The second part of this volume contains useful notes and references arranged under the same chapter headings as in *The Psychology of Personnel*. P.S.

The Canberra System of School Athletics: F. SHANN. (Australian Council for Educational Research, Research Series, No. 63, Melbourne University Press, 1947.)

This excellent little book gives details of a system of school athletics enabling nearly all boys to take part profitably. Boys are grouped for competition on a points rating, which is a composite function of age, height and weight, instead of the usual age divisions. Six standards are available for each event in each group and by equating performances in different events, after the manner of the international points system for decathlon scoring, an athletics quotient is obtained, so that each boy can recognize and appraise his all-round athletic ability. As a result of all tests and the final Sports Day competitions, each boy is placed on a general order list for each event in which he competes, and scores points accordingly.

This is a painstaking work; the statistical material is well handled and clearly set out (a great deal of the original data comes from an American publication, *The Measurement of Athletic Power*, by C. H. McCloy.) The average and poorer boy has hitherto been neglected in much of school athletics and, while pre-occupation with these boys is eminently justifiable, it might reasonably be argued that the process has been carried too far in this system, especially in the establishment of a general order for each event. It is unfortunate, too, that the book opens with a section laying claim to certain benefits deriving from athletics, for which no evidence is available.

Nevertheless, the book represents a serious attempt to use athletics intelligently in the service of education and it could be read with profit by all interested in Physical Education and particularly in Athletics.
A.D.M.

Intelligence Tests for Children: C. W. VALENTINE. (London: Methuen and Co., pp. 81+xiv, 5s. net.)

This is a new and revised edition of Professor Valentine's handbook formerly entitled *Intelligence Tests for Young Children*. In its original form the book sought to provide a variety of simple and interesting tests for children from the ages of $1\frac{1}{2}$ to 11. The new edition includes tests for older children up to the age of 15. Thus the book can now be used for testing pupils of 11 plus who are being selected for an appropriate type of secondary education; and the addition of problems for higher mental ages makes it possible to examine brighter children at the age of transference.

One feature of the original series has appealed particularly to teachers in these post-war years; it dispensed with all elaborate apparatus that might require to be imported from abroad or purchased at some expense. Most of the test-material needed was furnished by the book itself in the shape of pictures or diagrams. For the rest nothing was required except a little simple apparatus such as can easily be found or made in the school or at home. This admirable principle has been preserved in selecting new tests for the higher ages. They include problems of well-established types, such as Reasoning, Analogies, Absurdities, together with Performance Tests including Mazes; but the mazes and other diagrams are printed in the book itself, and nothing else is wanted but cards cut to the appropriate shapes, and occasionally a pencil and paper.

In the past, many of the test-scales produced for school pupils have been constructed either by laboratory psychologists with little or no teaching experience, or by teachers not very familiar with modern scientific principles for standardizing such tests. Professor Valentine's tests have a double advantage; they can claim the scientific merits of a scale that is constructed by one who is a leading educational psychologist; at the same time they show a first-hand practical appreciation of the needs of the teacher in the classroom.
C.B.

Language in Society: M. M. LEWIS. (Thomas Nelson and Sons, 1947, 12s. 6d. net.)

As Mr. Lewis reminds us, "we are in the midst of a Linguistic Revolution. To-day, for the first time in history, we see the possibility of universal literacy, and the possibility that all men at the same moment may be listening to the same voice or reading the same words."

In a most interesting way, the author examines our preparedness for this development of civilization. Not the least valuable of his contributions is the chapter "Language and the Individual Mind," in which he focuses more clearly and comprehensively than ever before the work of Ward, Stout, Alexander, McDougall, Freud, and Jung, as it has illuminated the problems of verbal expression of meaning. He is successful in dealing with the use of language in politics, in warfare, in social conflict and social integration. Teachers and advanced students both of psychology and of linguistics, will find the book of considerable value.
T.H.P.

The Teaching of Arithmetic and Elementary Mathematics: W. L. SUMNER. (Oxford, Basil Blackwell, 1946, pp. 255, 7s. 6d. net.)

The first edition of this useful book appeared in 1938, and it is gratifying to know that a second edition has been called for. Some changes have been made, and these will increase still more the value of the book, particularly to teachers in secondary modern schools; but those engaged in teaching mathematics in other types of secondary schools will find much that is interesting and stimulating in

this volume. The treatment is sound; useful teaching techniques are suggested; the historical approach is stressed.

An additional chapter on "Going Ahead—Towards the Calculus, Statistics and Probability, the Growth Function," will be especially welcomed by many teachers who will look forward to the publication of the author's promised "Introduction to Statistics for Students of Education and Psychology." E.C.C.

The School Looks Around: E. LAYTON and J. BLANCO WHITE. (Longman's, Green and Co., for The Association for Education for Citizenship, 1948, 8s. 6d.)

This book is a compendium of local surveys which have been successfully carried out by children and adults in many kinds of schools and units of further education. The emphasis is on surveys of history, geography, and the workings of the community, and is a useful contribution to the training for citizenship. The teacher will find a wealth of topics upon which to direct the energies of his class and some valuable suggestions on the method of presentation of the results. A very useful chapter is one on sources of further information, always a problem with local survey work.

It is a pity that the bias of the book precludes a widening of its scope to include the treatment of biological surveys, which though rarely carried out by schools, can be very valuable studies, especially in rural areas where the more usual topics for local survey work are not very productive. L.B.B.

Children Need Teachers: K. S. CUNNINGHAM and ELWYN A. MORLEY. (Published by Melbourne University Press for the Australian Council for Educational Research, 1947, 10s. 6d.)

Although primarily a report on the supply of suitably trained teachers for Australian schools, this book is of wider interest. The first half gives an account of the staffing difficulties which faced educational administrators in many countries, especially in Britain and the U.S.A., at the end of the war, together with a digest of the main publications up to the end of 1944 which suggested remedies for the teachers shortage. Of general interest, too, is the result of a questionnaire given to a representative group of Australian teachers on such topics as the teacher's attitude to his work, to inspectors, and his reasons for entering the profession. A comparison is interesting between the reasons given by this group of adults and those recorded by F. M. Austin of a group of adolescents contemplating entry to the teaching profession. (This *Journal*, Vol. 1.)

The rank difference correlation between the order of preference of similar reasons by the two groups is only .31. L.B.B.

Fundamentals of Statistics: TRUMAN LEE KELLEY. (Harvard University Press. London: Geoffrey Cumberlege, pp. XVI+755, 55s.)

As the pages and price indicate, this is a very substantial volume, and the name of the author ensures a welcome. The author points out that it is more than a revision to an earlier edition in 1933. He has tried to emphasize the logic and principles underlying statistical treatment. The early chapters deal with elementary fundamentals, later ones becoming more specialised and technical. A large number of statistical tables are given in the last chapter.

It is regrettable to find once more in an American book the relative neglect of British workers in the field dealt with. There is no reference to Sir Cyril Burt (especially surprising in view of Burt's emphasis on the logic of statistics), and the only reference to Professor Godfrey Thomson is to his very early book in collaboration with William Brown.

Psychology for Living : HERBERT SORENSON and MARGUERITE MALM. (McGraw-Hill Book Co., Inc., pp. IX+637, \$3.00)

The chief interest in this book arises from the fact that it is written especially for high school students in America, both the authors having had experience in teaching in high schools there. One may question whether psychology is a suitable subject for such students, but if it be granted that it is, then at least the style of this book is well adapted to them. Is it chatty, topical, freely illustrated, with many questions for discussion.

It is doubtful whether the students would have any coherent system of psychological knowledge at the end; but one can imagine that they would be greatly interested and even entertained by much of the material, especially the sections on "Getting on with people," "Worries and complexes," "How to study," and, perhaps, above all the section on "Courtship and marriage." Several pages here are given to an imaginary conversation about "necking," and its desirable limits. The illustrations also give a clue to the type of treatment, and there are photographs of a husband reading the paper at breakfast, ignoring his wife, and of a happy couple watching a child at play.

The Reach of the Mind : J. B. RHINE. (Faber and Faber, Ltd., London, 188 pp., 10s. 6d. net)

An increasing number of experimental psychologists are becoming aware of the fact that it is no longer possible to ignore the findings of experimental work in parapsychology. Dr. Rhine has been a distinguished contributor to this work and his new book gives an admirable summary of the evidence for such processes as thought-transference, clairvoyance and telekinesis. These are findings contrary to the expectations of orthodox psychological theory, but the science of physics has successfully assimilated ranges of fact contrary to the expectations of its traditional theory by making the appropriate modifications in that theory. It looks as if psychology must be prepared to do the same. The first step is for psychologists to become familiar with the kind of facts that have to be explained and with the nature of the evidence for them. Both are admirably dealt with in this book. R.H.T.

The Child is Right : A Challenge to Parents : JAMES HEMMING and JOSEPHINE BALLS. (Longmans, Green and Co., Ltd., pp. XIII, 176, 6s.)

The title of this book is at the same time unfortunate, and yet fortunately incorrect.

The book, addressed primarily to parents, is based largely upon individual cases known to the writers, most of which are interesting and illuminating; but the authors do not maintain that the child is always 'right' in the sense of not needing restraint or even penalties, and it would be most unfortunate if parents got that idea from the book.

The first author deals with the nursery years, and the second with middle childhood and the adolescent period.

The examples, described in simple language, will make entertaining reading for parents, but the general principles are not always thoroughly expounded, and it is doubtful whether from the individual cases the parents will be able to conclude what their own policy should be in cases which are not likely to be precisely the same.

Child Guidance : WILLIAM MOODIE, M.D., F.R.C.P., D.P.M. (pp. 48, Cassell and Co., 4s. 6d.)

This book, by the Medical Director of the London Child Guidance Training Centre, gives a brief, but clear and sound, exposition of the general procedure adopted in Child Guidance Clinics in this country and of the theory behind this procedure. It has not been written for the specialist but should prove a useful introduction to

Child Guidance for teachers, parents, doctors and all others interested in the welfare of children. Dr. Moodie wisely avoids going into details of controversial issues, such as the rival theories of play therapy. Such a discussion would be out of place in a book intended, as this one is, for those desiring merely an introduction to Child Guidance. H.B.V.

A Practical Handbook of Psychiatry for Students and Nurses: LOUIS MINSKI, M.D., F.R.C.P. (Heinemann Medical Books, pp. 128, 6s.)

This little book covers in a small space a very wide range of topics, including all the main types of neuroses and psychoses, ætiology of mental illness, child psychiatry, specialized forms of treatment (e.g., insulin, convulsion therapy, pre-frontal leucotomy), occupational therapy, and legal aspects of psychiatry. Inevitably the exposition is often highly compressed and occasionally dogmatic and there are sometimes many technical terms to a page. The book would be most useful as a kind of printed summary to be used by the students for revision after a full series of lectures. As a first book for beginners it would be likely to prove somewhat indigestible.

Teach Yourself to Teach: L. WILKES. (The English Universities' Press, Ltd., pp. V+194, 4s. 6d.)

This book contains many practical suggestions and hints of value to the untrained teacher; but it hardly does justice to the importance of the actual process of training in the Training College or University, though the writer is herself a lecturer in one.

OTHER PUBLICATIONS RECEIVED.

The mention of a book in this list does not preclude a subsequent review.

L'Univers Non-Dimensionnel: PHILIPPE FAURE-FREMIET. (Presses Universitaires de France, pp. 152, 220 francs.)

La Chance: JOSEPH OHANA. (Presses Universitaires de France, pp. 168, 180 francs.)

La Dénonciation et les Dénonciateurs: L. JH. COLANERI ET G. GERENTE. (Presses Universitaires de France, pp. 197, 240 francs.)

La Science, La Raison et La Foi: S. VAN MIERLO. (Presses Universitaires de France, pp. 284, 380 francs.)

Essai sur La Vie De Chacun: ANDRE WALTZ. (Presses Universitaires de France, pp. 216, 290 francs.)

La Découverte De Soi: GEORGES GUSDORF. (Presses Universitaires de France, pp. 513, 700 francs.)

The Training of a Doctor: Report of the Medical Curriculum Committee of the British Medical Association. (Butterworth's Medical Publications, pp. 151.)

The Unknown World of the Child: DR. ANDRE ARTHUS. (Paul Elek Publishers, Ltd., pp. 175, 9s. 6d.)

The Americas: E. M. SANDERS. (Geo. Philip and Son, Ltd., pp. 96, 3s. 6d.)

Adjustment to Physical Handicap and Illness—A survey of the Social Psychology of Physique and Disability: ROGER G. BARKER, BEATRICE A. WRIGHT, MOLLIE R. GONICK. (Social Science Research Council, pp. 372.)

Speech Development of a Bilingual Child: WERNER F. LEOPOLD. (Geo. Banta Publishing Co., pp. 295, \$5.50.)

Accrediting for Public Examinations in Australia: Australian Council for Educational Research. (McCarron, Bird and Co., pp. 44, 2s. 6d.)

- Sublimation* : J. TREVOR DAVIES. (Allen and Unwin, Ltd., pp. 148, 6s. 0d.)
- Education in Aberdeenshire before 1872* : IAN J. SIMPSON. (University of London Press, Ltd., pp. 229, 5s. 0d.)
- Who Rides in the Dark?* STEPHEN W. MEADER. (Basil Blackwell, pp. 192, 6s. 0d.)
- The Worker and the State* : SIR FRANK TILLYARD. (Routledge and Kegan Paul, pp. 302, 16s. 0d.)
- Latin through English—A Basic Vocabulary* : C. W. VALENTINE. (Macmillan and Co., Ltd., pp. 60, 2s. 6d.)
- La Pédagogie Scolaire* : EMILE PLANCHARD. (Casterman, pp. 368.)
- Le Dessin de L'enfant* : M. PRUDHOMMEAU. (Presses Universitaires de France, pp. 174, 200 francs.)
- The Educational Reconstruction of Education* : C. BLACK. (Victor Gollancz, Ltd., pp. 87, 3s. 6d.)
- Psychology and Mental Health* : C. W. VALENTINE. (Methuen and Co., pp. 82, 4s. 0d.)

EDITOR'S NOTE.—It is regretted that the fourth article by Professor F. J. Schonell on "The Development of Educational Research," is not ready in time for this number of the *Journal*. We hope to publish it in the next number.